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A YEAR'S STUDY OF THE DAILY LEARNING OF SIX CHILDREN

By GEORGE E. FREELAND

INTRODUCTORY STATEMENT

There is a definite need, at present, for long and careful experiments in child learning. The numerous problems raised by Thorndike, Freeman, Hall, and others demand attention before much progress can be made in methods of teaching, educational and psychological measurements, school administration, and educational psychology.

Eight years of study on these problems, during which time the available literature in English, German, and French was read, reveals the following situation:

1. All investigations of child learning have been of extremely short duration. No one has followed a group of children scientifically studying their learning through an entire school year in any subject. The psychology of child learning is at present based upon studies, few of which have gone beyond the initial stages. The total time of most of our widely quoted studies does not exceed two or three hours of practice. Kirby's study in arithmetic is a good illustration. Thorndike made frequent use of it in his Vol. II. The total time of learning did not exceed ninety minutes.

2. Most of the conclusions of scientists concerning learning in the elementary school are based upon investigations of the learning of adults. The majority of the studies mentioned by Freeman in "How Children Learn" were made upon adults. A typical conclusion from Thorndike's "Psychology of Learning" is given for further illustration. "The experimental results obtained justify *in a rough way* the avoidance

of *very* long practice periods and of *very* short intervals. They *seem* to show, on the other hand, that *much* longer practice periods than are customary in the common schools are *probably* entirely allowable. . . . *On the whole, however, so very few of the infinite ways in which any given total time can be distributed have been tested— . . . that psychology has little yet to offer in advance of the experience of sagacious workers."* (*Ed. Psy.*, v. ii, pp. 194 and 206.)[1]

It is interesting to note that he bases this very qualified conclusion for *common schools* upon ten investigations, all but one of which were made upon adults, and the one made upon children (Kirby) shows exactly the opposite to his (Thorndike's) conclusion.[2]

Lack of space prevents further illustrations, but the above situation was the motive for making the study that is reported here. It is not entirely conclusive and is only one of a large number needed to furnish us with data from the actual work of children over a long period of time under typical school conditions.

The Plan of this Study

Typewriting was chosen for the following reasons: (1) It offers a medium in which the children had had no previous practice. (2) Several careful studies of adults have been made with typewriting. (3) It furnishes definite objective evidence in strokes, of amount accomplished, mistakes, and so on. These may be compared at any time after the practice is over.

Six Children were selected upon the basis of normality. Their intelligence quotients showed a range of only five points in the Stanford Revision of the Binet Tests. The plan was to study a few normal children in a more careful way than would be possible with a large number. *One child for each grade from one to six* made up the group.

Each child practiced for *ten minutes a day five days a week,* but with the *usual school intermissions.* All the work was done in the forenoon between ten-thirty and twelve o'clock.

One teacher who worked *under the observation of the writer,* taught all the children. The machine used was a *Royal No. 10.* The *touch system* with the keyboard entirely hidden from sight was adhered to.

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[1] Italics in this quotation are mine. They show the extent to which lack of data forced qualification.

[2] These illustrations are not made to criticize Thorndike or Freeman. They have been first among those who deplore the lack of scientific studies of child learning.

The investigation covers a full school year with the influence of the summer vacation. One child is followed for a period of four years, in which time he *relearned three times.*

What May be Concluded from Such a Study

First, with six normal children as subjects the facts gained in this study should give a fairly clear picture of how the normal child in each grade (up to the sixth) advances *in typewriting* when practicing ten minutes per school day. It should also show the influence of vacations, initial and later practice, and speed in connection with accuracy in the subject of *typewriting.*

Second, since typewriting is a complex subject, similar to reading, until we have further data we may assume that the general facts true of children learning to typewrite are true of children learning to read; that vacations, initial and later practice, and speed in connection with accuracy will have similar influence in all complex subjects.

At present most of our educational psychology is based upon conclusions of the second type. A good illustration is found in Thorndike (*Ed. Psy.,* Vol. 3, p. 14). Here he refers to the work of Miss Arai as continued effort in a "very difficult intellectual process." *His discussion shows that he considered her experiences with arithmetic gave evidence of what others were likely to experience in any mental work* (reading, thinking, or memorizing).

It must be admitted at the beginning that conclusions of the second type are, at best, always doubtful even though they are common and make up about nine tenths of our present educational psychology. They will be given for what they are worth in each section that follows.

Conclusions of the first type, however, are mostly valid. If more children had been studied, the conclusions would be worth more. It should be added that *this is the only published study of children learning to typewrite* and has *more learners than any of the famous adult studies of typewriting.* Book had four learners, Swift one, and Hill and Rejall two. It also *follows with daily records one group of children over a longer continuous period than any other published study of child learning.*

This investigation has been made after a careful study of the work of others. It is assumed that the reader is acquainted with the literature; the discussions and comparisons treat of points that, if their history were gone into, would require a volume.

Facts on the Amount Learned

The amount learned is a factor entirely absent from all our studies of learning. When a child learns to read, his progress is from the ability to pronounce c-a-t to the ability to read a connected sentence to the ability to read a paragraph, to the ability to read a story, and so on.[3] His speed and accuracy, if the facts in typewriting may be carried over to reading, probably increased very little after he reached the second stage, that is, learned to read a sentence.

The need of studies of the amount learned is expressed by Thorndike as follows: "I should eagerly have seized upon any measurements of learning in arithmetic which measured the learner's advance from 'ability to add numbers to 9 plus 9' and so on. Nobody has ever had children learn geometry or painting or chemistry under defined conditions, testing from time to time the kind of thing they could at that time achieve." (*Ed. Psy.*, V. 2.)

The progress of two individuals from this standpoint is revealed in the data which follow. Records of the other children are on file at the University of Washington.

Six-year-old boy

March 28, 1916.

First lesson of year (10 min.)

rt u r yu rtyu rtyu rtyu rtyu rtyu rtyurtyu rtyu rtyu rtyu
rtyu rtyu rtyu rtyu rtyu rtyurtyu rtyu rtyu rtyurtyu rtyuu
rtyu rtyu rtyu ruyu rtyu rtyu rtuu rtyu rtyu

March 15, 1917.

Last lesson of year

Water won't quench fire,
Fire won't burn stick,
Stick won't beat dog,
Dog won't bite pig,
Pig won't get over the stile,
And I can not get home to-night.
The rope said,
"I won't hang butcher."
The old woman met a rat.

March 17, 1916.

Twelve-year-old boy

First lesson of year (10 min.)

She said,
"Please make some shoes.

[3] This order of development in reading may be questioned. It is merely illustrative and not the important issue here.

I want them for the little boy,
Then he will shake the Oak-tree,
The oak-tree will give me a cup.
The spring will give me some water.
I want it for little Tuppens.
He is choking."
The shoemaker said,
" Get me some leather,
Then I can make some shoes,
The boy will shake the oak-tree,
The oak-tree will give me a cup,
The spring will give me some water.
I want it for little Tuppens.
He is choking."
The cow said,
" Get me some corn.
Then I will give you some leather."
The old hen ran to the farmer.

In every case the fundamental difficulties of typewriting had been overcome. Adjusting to the machine, correct fingering, development of fair flexibility and strength of the smaller fingers, mastery of the keyboard by touch, and so on, make up a formidable array. Aside from speed and accuracy, the mastery of all these different phases of the work was the chief accomplishment of the learners.

Each child covered the first thirty exercises in the " Standard " instructor and advanced as far as he could into the Free and Treadwell readers. At the end of the year they had covered in the readers:

Grade I	Grade II	Grade III	Grade IV	Grade V	Grade VI
34pp	35pp	56pp	Withdrew at end of 3 months	Withdrew at end of 3 months	96pp

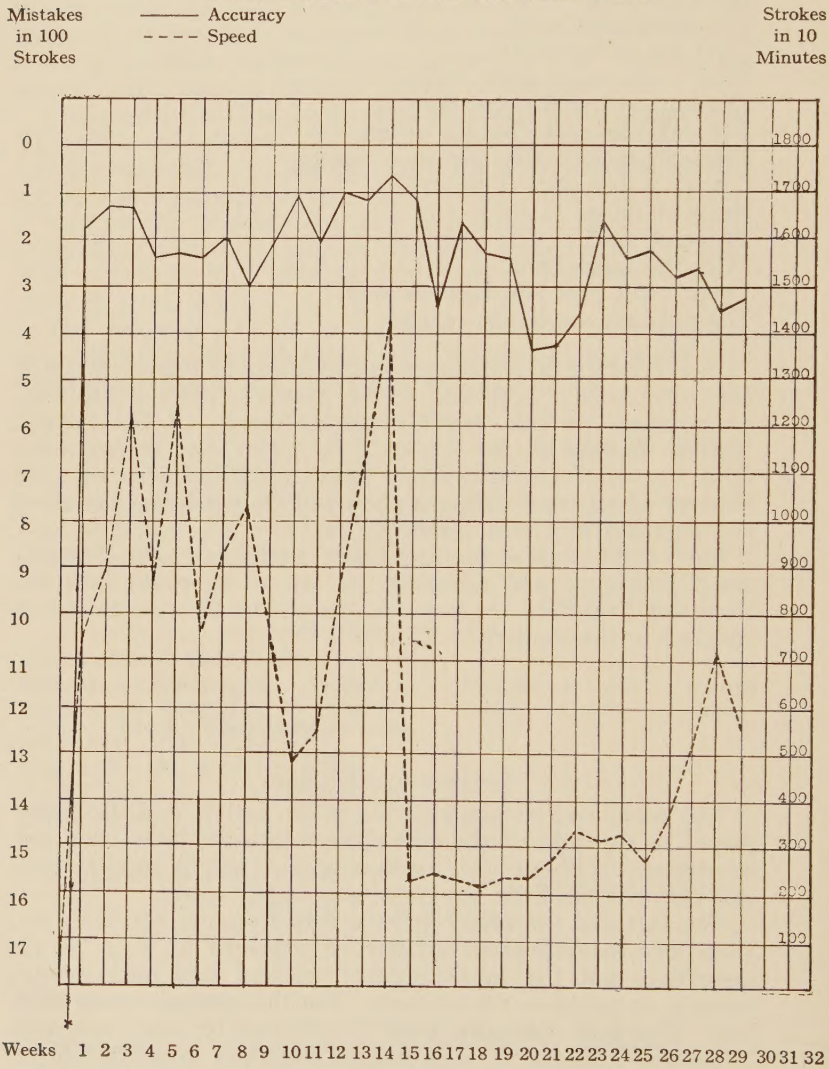
Speed and Accuracy

The speed and accuracy curves which follow must be interpreted in the light of the difficulties which are being met and overcome. Without such interpretation it might appear from the curves that little progress was being made.

The fact that the speed curve is very irregular and does not show any marked progress may be regarded by some as an indication that the subject-matter selected was not " easy " enough, or suited to the learners. But this subject matter was the " Standard Exercise Book " followed by the Free and Treadwell Readers. It was not the intention to select subject

matter of the kind used in school work. The learning curves given below should be more reliable than those reported in other studies of typewriting. They are probably typical of curves of children learning complex functions. Curves of their

CURVES OF THE SPEED AND ACCURACY BY WEEKS OF THE SIXTH GRADE BOY FOR THE FULL YEAR



advancement in speed and accuracy in reading or arithmetic would very likely be similar.

From the foregoing curves several important points are evident. They may be enumerated as follows:

1. Speed fluctuated much more than accuracy. The reason for this extreme fluctuation in the speed curve was chiefly the material used. A new lesson involving new combinations of letters and new adjustments seemed to slow down the work but had very little influence upon the accuracy.

2. The rise and fall in accuracy seems to have had very little relation to the rise and fall of speed. They both fluctuated in the same direction at times, in opposite directions about as often, and in the same direction but entirely out of proportion to each other at other times. Detailed illustrative comparisons of this relation are furnished for the first term. They are:

Boy 7 years old.

Accuracy takes opposite turn to speed on days; 3, 9, 10, 13, 14, 15, 16, 18, 21, 25, 26, 30 (12). Accuracy approaches agreement with speed on days; 2, 6, 7, 8, 11, 17, 19, 20, 27, 28, 29, 31, 32, 33, 34, 36, 37, (17). Accuracy varies in the same direction as speed but in entirely different proportions in days; 4, 5, 12, 22, 23, 35, (6).[4]

When improvement from one day to the next was considered, with approximately 600 measures to compute, a positive correlation of .14 was found. This is practically the same as no correlation.

3. It soon became apparent that accuracy was harder to improve than speed. Drill would improve speed in every case. Something more subtle and harder to employ was necessary to improve accuracy.

This refers to the work after the initial improvements in speed and accuracy. After the first two weeks the accuracy curves fluctuate back and forth throughout the year. The speed, although fluctuating as shown in the curves until all the different phases of typewriting had been encountered, finally began a gradual rise with practice. The accuracy did not do this.

Tables of daily speeds and accuracy follow:

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[4] These are comparisons of *improvement over the preceding day.* It must be kept in mind that the improvement of speed and accuracy is not the same as scores in speed and accuracy.

SIXTH GRADE BOY

Lessons Spring Term	Date 1916	Strokes in 10 Min.	Errors to 100 Strokes
1	3/17	80	6.2
2	3/20	480	5.4
3	3/21	740	1.7
4	3/22	815	2.5
5	3/23	970	2.9
6	3/24	870	4.5
7	3/27	835	2.1
8	3/28	996	2.9
9	3/29	900	1.4
10	3/30	896	4.5
11	3/31	....	...
12	4/3	952	5.7
13	4/4	1232	1.5
14	4/5	336	8.
15	4/6	594	9.2
16	4/7	650	5.3
17	4/10	785	5.
18	4/11	860	2.9
19	4/12	875	4.6
20	4/13	855	8.7
21	4/14	890	2.6
22	4/17	1240	2.5
23	4/18	566	6.
24	4/20	834	4.
25	4/21	612	5.2
26	4/24	540	6.6
27	4/26	786	2.6
28	4/27	735	6.6
29	4/28	880	4.6
30	5/2	840	4.5
31	5/3	935	2.1
32	5/4	910	6.7
33	5/5	770	5.8
34	5/8	825	4.4
35	5/10	1025	3.
36	5/12	1204	3.1
37	5/15	1166	2.4
38	5/16	1070	2.7
39	5/17	1390	3.8
40	5/18	816	4.
41	5/19	798	2.3
42	5/22	385	6.2
43	5/23	464	1.2
Fall Term		(Summer Vacation, 120 Days)	
1	9/22	475	7.7
2	9/25	765	3.
3	9/26	818	.3
4	9/27	626	2.
5	9/28	1091	3.9
6	9/29	560	2.1
7	10/2	420	6.6
8	10/3	922	3.

SIXTH GRADE BOY

Lessons Spring Term	Date 1916	Strokes in 10 Min.	Errors to 100 Strokes
9	10/4	858	1.
10	10/5	620	7.
11	10/6	617	7.6
12	10/9	530	4.5
13	10/10	800	1.6
14	10/11	1182	3.3
15	10/12	1110	1.2
16	10/13	710	1.5
17	10/16	920	2.3
18	10/17	875	2.1
19	10/18	1410	.7
20	10/19	422	1.6
21	10/20	220	12.2
22	10/23	275	7.6
23	10/24	199	8.5
24	10/25	126	8.7
25	10/26	235	1.2
26	10/27	185	8.1
27	10/30	156	7.
28	10/31	210	4.7
29	11/1	245	3.7
	6 Days' Vacation		
30	11/9	249	1.8
31	11/10	224	3.1
32	11/11	242	4.1
33	11/13	....	...
34	11/14	....	...
35	11/15	(Record lost)	
36	11/16	....	...
37	11/17	....	...
38	11/20	....	...
39	11/21	....	...
40	11/22	212	4.7
41	11/23	233	4.7
42	11/24	215	2.3
43	11/27	212	6.6
44	11/28	257	3.
45	11/29	239	2.5
	Vacation		
46	12/4	....	...
47	12/5	239	4.1
48	12/6	211	9.9
49	12/7	....	...
50	12/8	320	4.6
Winter Term			
1	12/13	229	11.3
2	12/14	262	4.1
3	12/15	288	5.2
4	12/18	208	9.6
5	12/19	237	13.4

SIXTH GRADE BOY

Lessons Winter Term	Date 1916	Strokes in 10 Min.	Errors to 100 Strokes
6	12/20	433	5.3
7	12/21	330	3.6
8	12/22	....	...
	Vacation 18 Days		
9	1/8	181	13.7
10	1/9	316	1.6
11	1/10	....	...
12	1/11	....	...
13	1/12	....	...
14	1/15	162	6.6
15	1/16	328	2.4
16	1/17	320	8.4
17	1/18	304	9.5
18	1/19	302	3.6
19	1/22	....	...
20	1/23	....	...
21	1/24	(Record lost)	
22	1/25	....	...
23	1/26	....	...
	Vacation		
24	2/5	229	6.5
25	2/13	286	2.4
26	2/14	436	3.4
27	2/15	485	5.7
28	2/16	....	...
29	2/19	384	2.8
30	2/20	410	5.1
31	2/21	448	6.6
32	2/22	....	...
33	2/26	409	5.6
34	2/27	470	6.1
35	2/28	538	3.7
36	3/1	516	2.6
37	3/2	....	...
38	3/5	703	3.5
39	3/6	....	...
40	3/7	584	5.3
41	3/8	680	...
42	3/9	....	...
43	3/12	....	...
44	3/13	475	5.6
45	3/14	572	3.1
46	3/15	331	5.7
47	3/16	764	3.7

(Complete records of other children are on file at the University of Washington.)

In this connection, it must be kept in mind that most of the studies of learning concerning which large "gains" were reported, have based their reports upon gains in speed alone.

Kirby[5] found that his group in addition gained 48 per cent in speed and lost 4 per cent in accuracy. The group in division gained 75 per cent in speed and gained 2/6 per cent in accuracy. Hahn and Thorndike[5] report that "school children will *maintain* or improve the percentage of correct answers in their total product." Again they say, "*Properly administered* drills will improve accuracy."

From my own study I have concluded that probably the biggest difficulty of all drill work that confronts the investigator and the teacher is this "proper administration" so as to increase accuracy as well as speed. It has been demonstrated any number of times that most drills, if persisted in, are likely to improve speed. But it has also been demonstrated that very few drills will improve accuracy. Brown[5] found improvement in accuracy from drills in arithmetic. But this improvement was far less in accuracy than it was in speed. Wells in studying tapping measured speed alone. Whitley in marking letters studied speed alone. Wells[5] in cancellation work found gains in speed "*without diminishing precision.*" (It is to be regretted that he did not try to discover some of the elements involved in increasing precision.) Leuba and Hyde[5] in substitution tests studied speed alone.

Thorndike in reporting various experiments in arithmetic says of Donovan and Thorndike "the average number of examples correctly done rose from 2¾ to 4½ per minute." He gives no attention to the increase or decrease in the percentage incorrectly done. "Wells" he says, "raised the *amount done* to nearly double *without decreasing the precision.*" Thorndike did not have data for a discussion of the improvement of accuracy. Many teachers have the mistaken idea that ordinary drill is equally effective in improving both speed and quality in any subject.

Intensive Study of Daily Fluctuations

Conditions that cause a great gain in speed, accuracy, or both, and the opposite conditions that may cause a fall in either or both of these seem to occur frequently. They often cause many peculiar performances which students of learning in the past have thought due to some special influence such as "fatigue," "vacations," "good teaching," "poor teaching," etc.

Any learning curve reveals these fluctuations. They are found in the studies of Swift, Book, Bryan and Harter, etc. We have a very good illustration in the study of Kirby who

[5] Vol. 2, reported by Thorndike in Educational Psychology.

found that 14% of the 600 children in his experiment did not improve from his drill but fell behind their original scores. Brown obtained similar results.

Let us take for illustration the work of S. K. (7 yr. boy) who on the first day of practice made a score of 165 strokes in 10 minutes with an accuracy of 33.3 mistakes to 100 strokes. He did less work and was more inaccurate the second day on the same material than the first. The third day he just equalled his first day's work in speed but his accuracy was much worse than on either of the other two days, and on the fourth day he made a slight gain in speed and, although his accuracy was somewhat better than it was the day before it was still worse than it had been the first two days. However on the fifth day he showed an entire change of form and both his speed and accuracy showed marked improvement.

A table of this work is given here:

Five lessons of 7-year-old boy on same material

Lesson	Strokes in 10 min.	Errors to 100 strokes
1	165	32.6
2	150	33.3
3	165	43.8
4	180	36.1
5	260	5.

The question here is, why on the second and third days of practice was there no gain in speed from the previous practices, and why on the second, third, and fourth days was there such a loss in accuracy? Then, on the fifth day, why such a change?

In the course of the year's practice there were 45 opportunities to compare work done on the same materials under the same conditions on succeeding days. In 27 or 3/5 of these periods the learners lost in speed, accuracy, or both. Careful observation at the time the work was done led to the conclusion that fluctuation was due to the fact that every performance was the result of a combination of factors. When enough destructive elements to overcome previous practice were present, scores were lowered. The chief factors noted were:

1. Interest—joy in the work, no conflicting desires, no worries, etc.

2. Physical condition—from general fitness to freedom from aches and pains.

3. Mental alertness—the quick response that takes advantage of every situation.

4. Tenacity—Often a good start would give way to poor work before the end of 10 minutes. Sometimes during a period

of a few minutes excellent work would be done, only to be followed by a slump.

Where we view a performance in the light of such summation, the reason for the many peculiar records found in all experiments in learning is apparent. *X* may make more gains with a bad cold than he did when he did not have a cold. A cold is only a part of his physical condition and outside of physical condition there are a number of factors which influence his performance. If other proper combinations are formed, they may overbalance the difficulty caused by the cold. Thus anything is possible within the limits of the probable combination of factors.

The above is also a very clear indication that an objective performance should not always be taken at its face value. *X* may make a performance better than his typical record. It may be due to the presence of optimum conditions which are rarely present in his case.

Overcoming a Plateau

Plateaus have made up an interesting section of discussions of learning. As may be noted from the graphs they occurred with all the children in this study. Since no one has worked upon the problem of using special means to overcome a plateau, it was tried in the case of the six-year-old boy.

He was offered a series of awards. The added interest caused him to diagnose his weaknesses and eventually to overcome them. Four special difficulties which had caused the plateau were discovered. They were:

1. Importance of the correct placing of the hands.
2. Holding the shift key more firmly in making capitals.
3. Overcoming the failure to space.
4. Keeping the eye upon the copy rather than reading the copy and his writing. (This increased speed almost 50 per cent.) The records of his work are given here.

Date	Speed	No. of Mistakes	
Nov. 29	183 Strokes in 10 Min.	12	(Typical lesson before special award)
	Special Award Promised		
Nov. 29	183 Strokes in 10 Min.	10	(No award on account of speed)
Dec. 1	217 " " " "	7	(No award, accuracy)
Dec. 2	168 " " " "	2	(No award, speed)
Dec. 3	167 " " " "	2	(No award, speed)
Dec. 4	214 " " " "	3	(Award)
Dec. 5	174 " " " "	7	(No award, speed and acc.)
Dec. 6	181 " " " "	2	(No award, speed)
Dec. 7	242 " " " "	4	(Award)
Dec. 8	260 " " " "	3	(Award)
Dec. 9	309 " " " "	3	(Award)

When compared to any of the other records of this boy the gains that may be noted from the foregoing tables are very great both in speed and accuracy. They seem to show that with special interest aroused an eight-year-old child can break a plateau. It may be noted that with the coming of added interest all the difficulties did not vanish. It was a slow uphill fight. There were many days without any award.[6]

The permanence of the improvement which resulted from the special interest generated by offering the series of awards can be seen by the performance of the child twenty days later.

Date	Speed	Accuracy
Dec. 29	306 strokes in 10 min.	8 mistakes

After twenty days without practice, then, all the gain in speed is maintained and some of the gain in accuracy. In this last period no award was offered. The good results were not lost when the special interest was taken away.

The Influence of Vacations

The results indicate that a vacation of from one to fifteen days may cause either a gain or a loss, one is about as likely as the other. Thus, other factors were more powerful than the short vacation, so that its results were practically negligible.

The four months vacation, however, had a strong negative result except in the case of the boy in the sixth grade. The reason for his excellent retention was probably the fact that he had more thoroughly learned the essentials. When materials were not thoroughly learned, a four months vacation caused serious loss. When they were well assimilated, the four months were followed by even a slight gain.

Results of typical short and long vacations are given below.

Teachers' Institute Vacation

November 1 to November 9—8 days.

Table showing the influence upon speed and accuracy. The same material was written each of the two days.

[6] It must not be inferred that in the regular work this child or the others were not interested. At all times they showed as much interest as is ordinarily seen in well taught classes.

	Speed Strokes in 10 Minutes	Accuracy Mistakes to 100 Strokes
Boy 6 Years Old—Grade I.		
November 1	162	7.
November 9	288	8.
Boy 7 Years Old—Grade II.		
November 1	264	2.2
November 9	297	8.4
Boy 8 Years Old—Grade III.		
November 1	331	5.7
November 9	336	8.
Boy 12 Years Old—GradeVI.		
November 1	245	3.7
November 9	219	1.8

Summer Vacation

May 25 to September 23—120 days or 4 months.

Tables showing speed and accuracy in writing the same material before and after vacation.

	Speed Strokes in 10 Minutes	Accuracy Mistakes to 100 Strokes
Boy 6 Years Old—Grade I.		
May 25	285	26.4
September 23	234	56.
Boy 7 Years Old—Grade II.		
May 25	750	1.8
September 23	102	26.
Boy 8 Years Old—Grade III.		
May 25	600	10.8
September 23	131	55.
Boy 12 Years Old—Grade VI.		
May 25	464	1.2
September 23	475	7.7

Relearning After Summer Vacation of 120 Days

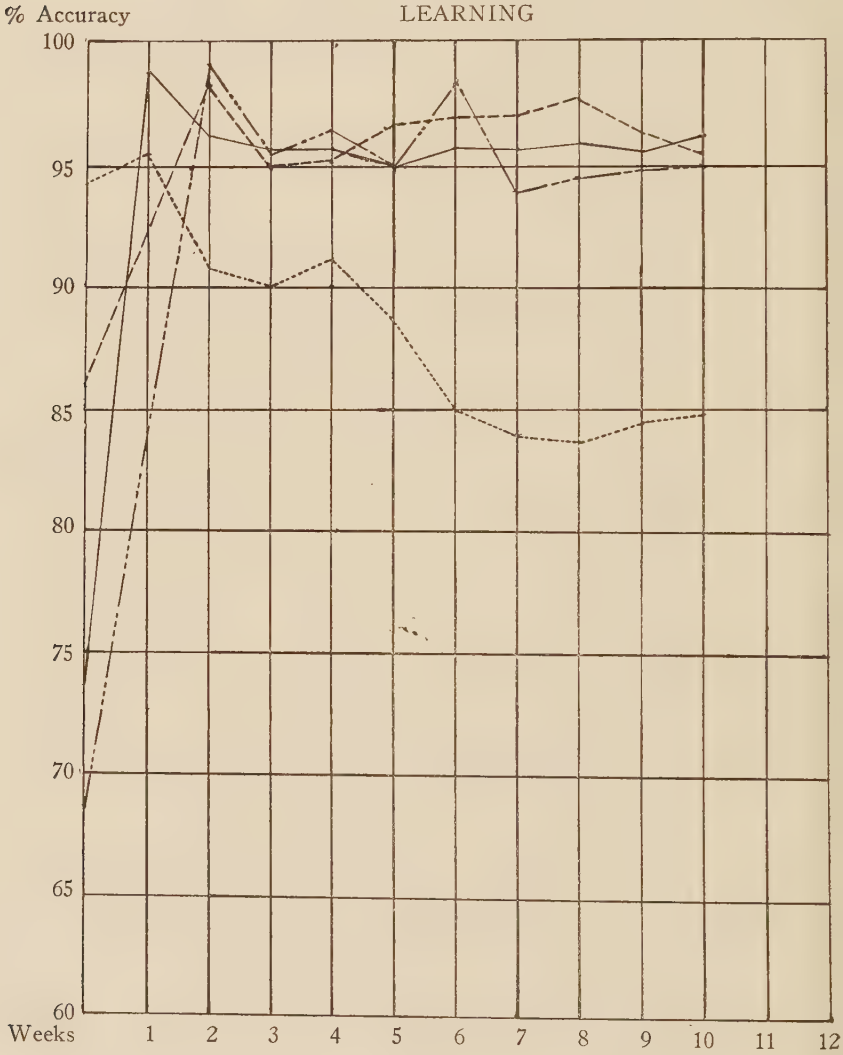
It took ten minute periods as listed below for the different children to regain what had been lost during the summer.

Grade I	Grade II	Grade III	Grade IV	Grade V	Grade VI
12 periods	10 periods	7 periods	Withdrew	Withdrew	No relearning necessary

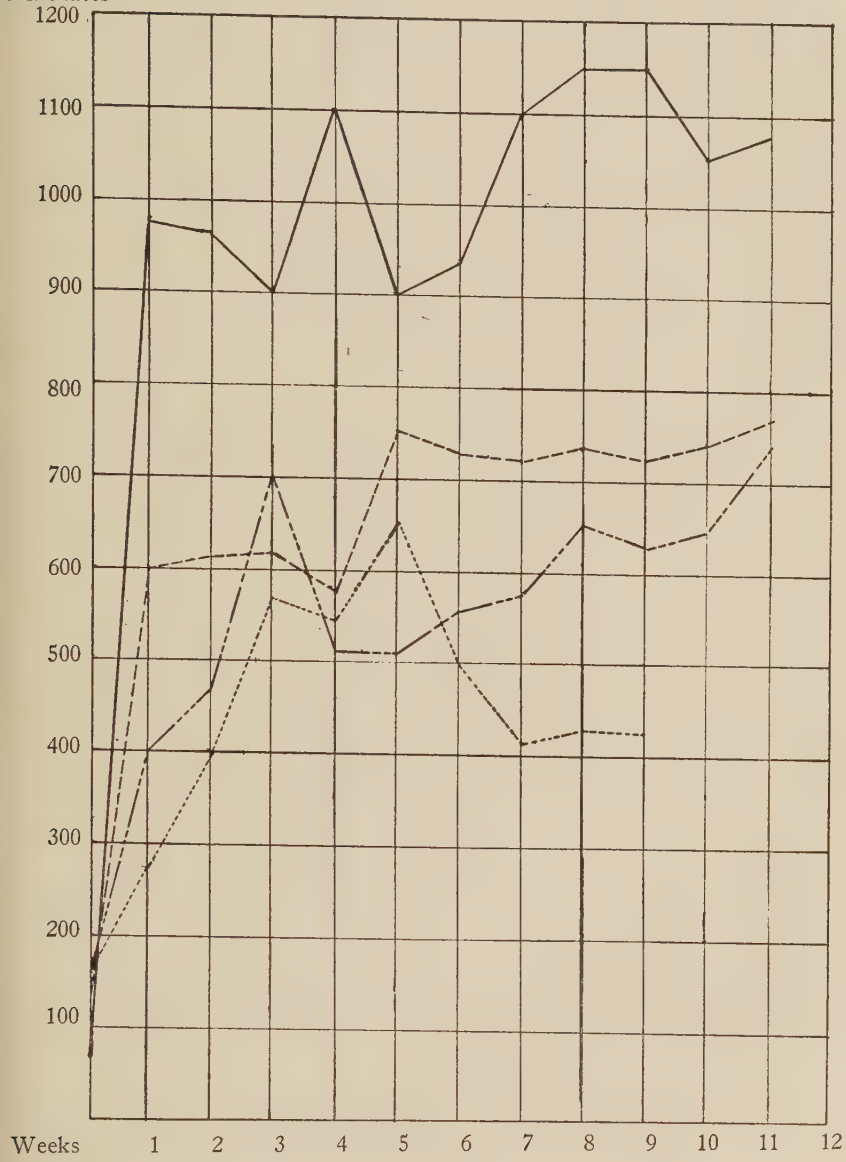
Relearning After Two Years

The six-year-old boy took up the work again after two years without practice. It took him nine periods (10 minutes.

ACCURACY CURVES OF FOUR CHILDREN FOR THREE MONTHS' WORK SHOWING INITIAL AND LATER LEARNING



SPEED CURVES OF FOUR CHILDREN FOR THREE MONTHS' WORK SHOWING INITIAL AND LATER LEARNING



each) to regain the ability he had at the end of his first year's work.

These performances indicate that although it may appear that such an ability has been lost entirely (and initial performances after long idleness indicated very low ability), it takes a very short time to relearn.

Initial Learning

The introductory statement mentioned the fact that practically all studies of child learning cover initial stages only. This is significant when interpreted in the light of the speed and accuracy curves given below. They show:

1. That after three weeks there was no advancement in accuracy. A study covering only 150 minutes of practice (which is longer than many widely quoted studies of child learning) would have demonstrated that practice has a very big influence in improving accuracy.

2. The older the child, the greater the initial spurt. This was probably due to the release of a capacity resulting from ordinary growth. It is interesting from the standpoint of learning in different grades. Little or no initial spurt may be expected of children entering school. Note the curves of the six-year-old boy.

The First Ten Minutes' Work and Learning Capacity

The question of initial performance and learning capacity has long been an interesting one. Can a ten minute test reveal the individual's ability to learn a function? The data of this experiment seem to show the contrary. In both speed and accuracy the first ten-minute period gave no indication of what was to follow. In fact, in the cases given here the first ten minutes indicated just the opposite to what followed. The speed curves on the preceding page show this.

This had a certain amount of significance for vocational and other testing. If by further experiments it should be determined that a ten minute period (or test) is not a reliable indication of learning ability, it would indicate that any test should be repeated upon different days or on a series of days (from 30 to 6 or 10) before it could be considered reliable for individual diagnosis. Hollingsworth[7] takes this position.

[7] Vocational Psychology.

Summary

1. The data and the experience of this study are convincing that in ten minutes per day a normal child in the first, second,

third, or sixth grade may learn the touch system of typewriting. However, the older child *learned it most readily and retained it best.* The teachers found him by far the least trouble, and it seemed that below the fifth grade, class work would be impossible in this subject. This study indicates that as far as the subject matter is concerned, typewriting could well be begun in the fifth grade.

2. Short vacations seemed to have a varying influence upon the records. Under school conditions they are probably negligible factors. The same child benefited by the Christmas vacation and lost during Thanksgiving.

3. Long vacations caused a fall in the work when the function was not well mastered. This would signify the need of a review at the beginning of each year's work. In the later stages of learning a long vacation had very little influence. Relearning was a very easy matter even after two years without practice.

4. The data showed that a teacher cannot be informed as to the progress and needs of children without constant testing. A few tests may point to the opposite of the truth.

5. The initial performances of the different individuals gave no indication of power or capacity.

6. The records revealed a very rapid gain during the first three weeks, followed by a much slower gain which at times seemed to be more of a loss than a gain. This was especially noticeable in accuracy. Accuracy improved very rapidly at first. After that it was doubtful whether it improved at all.

7. The younger the child the greater and more frequent were the fluctuations.

8. Each child reached a plateau and remained there. When special effort was made, a plateau was broken, indicating that this phenomenon is probably due to ordinary causes and not an essential feature of learning curves. However, it is evidently a part of all ordinary learning where special training factors are not employed.

THE PRESENT EDUCATIONAL CONDITIONS IN CHINA

By Ping Ling, Nankai College, China

One of the most hopeful signs in China to-day is that the people of the intelligent class have come to realize that the first and the most pressing need of China is the carrying out of the public and universal educational system which has been worked out and proclaimed at the beginning of the Republic. China has been considered a backward country. She is backward in every aspect of her national life. Financially, she is on the verge of bankruptcy; politically, she is gradually losing her independence because of foreign encroachment from without and the corruption of her officialdom from within; commercially, she is at the mercy of foreign profiteers; industrially, she has mortgaged practically all her resources and cannot offer her people any protection or even material encouragement in their competition with foreign capitalists along the line of industrial undertakings. In short, every aspect of her national life gives us a gloomy outlook and shows a very dark future. What are the fundamental causes of all these lamentable conditions? There can be only one answer to this question, that is, the ignorance of her people. As far as we can ascertain the percentage of illiteracy among her population is as high as ninety-five per cent. It is inconceivable that a republican government can exist when the large majority of its people are uneducated and illiterate. The success of a Republic depends upon the intelligence of its citizens. To build a Republic without a system of public and universal education is like building a castle upon quicksand as it can never be expected to last for any considerable length of time. So the crying need of China to-day is education, and education not only for a small number of her more fortunate citizens, but also education for every one of her young people who can and wishes to learn. It is the purpose of this article to first describe the general conditions of modern education in China and then indicate in a very brief way the different problems to be solved in this line of undertaking.

1. The General Condition of Modern Education in China.

Administrative Authorities: The highest authority is the Ministry of Education. At the head of the Ministry is the

Minister appointed by the President of the Republic and assisted by a Vice-Minister and three Councillors. Theoretically the Minister is responsible to the Parliament because China has a Cabinet system of government, but in reality he is responsible to the President, for the Parliament has never exercised its functions to any great extent ever since it came into existence. The work of the Ministry is divided into one general council and three departments. The general council has the charge of matters relating to schools under the direct control of the Ministry; school hygiene, the maintenance of public libraries, museums and educational exhibits, collection of information and compilation of educational statistics. At the head of each of the three departments is a director, appointed by the President on the recommendation of the Minister. These three departments have charge of matters concerning public education, technical and professional education, and social education respectively. Beside this general council and the three departments, there are attached to the Ministry sixteen inspectors, whose chief duty is to visit the different parts of the country annually and to make reports to the Minister concerning the actual conditions and the needs of the schools of different provinces. According to the regulation of national inspection proclaimed in 1913 the country is divided into eight inspectorial divisions: (1) Chili, Fengtien, Kirin, Heilung-kiang; (2) Shantung, Shansi, Honan; (3) Kiangsu, Anhui, Che-kiang; (4) Hupeh, Hunan, Kiangsi; (5) Shensi, Szechuan; (6) Kansu, Sinkiang; (7) Fukien, Kwangtung, Kwangsi; (8) Yunnan, Kwei-chow. Each of these territorial divisions is to have two inspectors. Mongolia and Tibet are temporarily subject to special regulations. The office of the inspector was made merely advisory in character to the authorities of the schools which he visits, but it is also his duty to report to the Ministry violations of the regulations proclaimed by the Ministry. He is to visit all the schools within the special territorial division assigned to him at least once a year, but he may be sent out by the Ministry at any time to make special investigations.

So far we have described the central educational authority. With regard to the provincial authority we find that the actual conditions are at great variance with the regulations proclaimed in 1913. According to the plan of 1913 each province is to have a Commissioner of Education appointed by the President of the Republic on the recommendation of the Minister of Education. He is equal in rank with the Provincial Treasurer, the Commissioner of Industry, the Commissioner

of Foreign Affairs and the Provincial Judge. Like them he is also under the control of the Civil Governor, who in turn is under the control of the Ministry of Education in all educational matters. But since the different provinces have never been completely united ever since the establishment of the Republic and since the Military Governors have taken the dominant place in the civil administration in the territories under their control, the authority of the Ministry of Education usually cannot extend itself much beyond the national capital. In many cases the Commissioners who have been appointed by the President are prevented from taking up their official duties by the Civil or Military Governors. In other cases the consent of the Military or Civil Governor must be secured before the appointment can be made. So the provincial and local administration of education in the various provinces has been far from being uniform and satisfactory.

The Commissioner has the power to appoint the principals of the elementary and secondary schools and the directors of the local "educational exhorting bureaus." But in every case the approval of the Civil Governor must be first obtained. The presidents of the technical schools and provincial colleges are appointed by the Civil Governor on the recommendation of the Commissioner. So the provincial administration of education is not in the hands of the Commissioner, who in every sense is the representative of the Ministry of Education, but in the hands of the Civil Governor, who may have no knowledge nor even interest in the educational affairs of the province.

Each province is also to have from four to six provincial inspectors appointed by the Commissioner. Their duties are to visit schools, to investigate, and to report the local educational conditions to the Commissioner. But due to the lack of trained men in the service all these visits and investigations are and have been made in a very superficial manner and nothing good has come out of them.

In short, the administrative authorities have been well provided but their functions have never been properly exercised on account of the lack of professional men, the chaotic conditions of the country, and the instability of the government.

The School System: The aim of education was conceived by the first Minister of Education under the Republic, Tsai Yuan Pei, to be the cultivation of moral character in the young, supplemented by an industrial and military training and rounded out by an aesthetic education. With this aim in view the whole system of education has been established on the

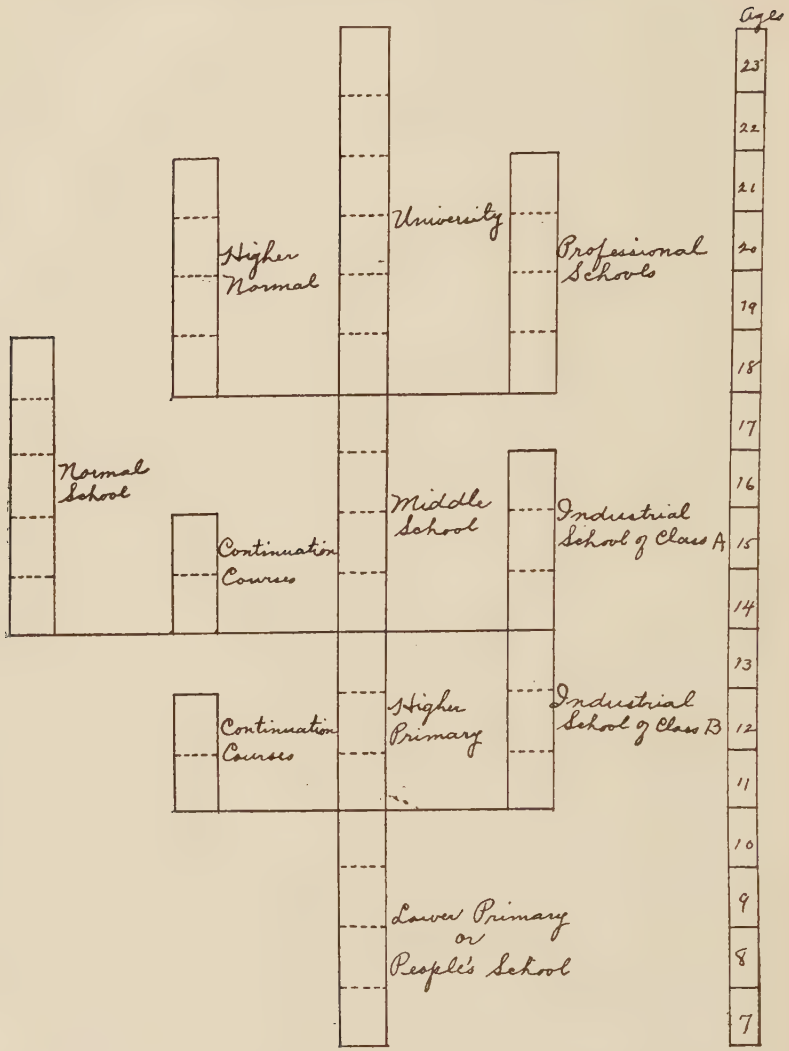
inauguration of the Republic. It may be briefly indicated by the following outline:

Ages	Schools	Length of Course
7–10	Lower Primary	4 years, meant to be compulsory.
11–13	Higher Primary	3 years.
	or	
	Industrial of Class B	Same.
	Middle	4 years.
	or	
14–17	Normal	1 year preparatory plus 4 years.
	or	
	Industrial of Class A	3 years.
	University	3 years preparatory plus 3 or 4 years collegiate work.
18–24	Higher Normal	1 year preparatory plus 3 or 4 years collegiate.
	Professional School	Same as above.

The school system may also be indicated by the following diagram:

The length of the lower primary course is four years and is meant to be compulsory. According to the regulation proclaimed by the Ministry of Education in the fifth year of the Republic (Oct. 9, 1916) the responsibility of establishing the lower primary schools or "People's Schools" was definitely assigned to cities, towns and villages which form a "self governing unit" according to the geographical division of the political administration. In case any "self governing unit" is not financially capable of establishing a "People's School," the district magistrate in co-operation with the local council is charged to make special arrangement with the neighboring "self governing unit" or units, so as to enable the children to attend school. This is essentially the idea of the consolidation schools in America. Children who graduate from the People's School may either enter the higher primary or the industrial school of class B. A continuation course of two years is also provided for those who can not attend the school of higher grade.

The course of the higher primary and the industrial school of class B is three years. The responsibility of establishing



these two kinds of schools was assigned to the district magistrate. All the expenses are paid from the district treasury. Graduates of the higher primary may enter either the middle school, or the industrial school of class A or the normal school. The course of the middle school is four years; that of the

industrial school of class A is three years; and that of the normal school is four years plus one year in a preparatory class. In case children can not enter either one of these schools, a continuation class of two years is again provided for them. The responsibility of establishing these schools was assigned to the provincial authorities, and all the expenses are paid from the provincial treasury. In case a district or a combination of several districts is financially capable of establishing a middle school, it is encouraged in every way to do so.

Graduates of the middle school may either enter the professional schools or the preparatory department of the universities or the higher normal schools.

The professional schools may be established by the central government, or provincial authorities, or private enterprise, while the universities and higher normal schools are supported from the national treasury.

The education for the girls has not been neglected by the framers of the present educational system. In the primary schools the girls and boys may be equally admitted, although they are usually required to be separated in classes. Special middle schools for the girls are provided for on the same basis as those for the boys. Girls' Normal Schools had been established even before the Republic. At present, many universities, both government and private, have admitted girls to their classes. Generally speaking, the education for girls is about ten or fifteen years behind that for boys, but we have come to realize the importance of women's education and we can entertain a hope that before long the girls' education will be placed on an equal footing with that of the boys.

Curricula: The most noticeable feature of the curricula of the different schools is their uniformity and rigidity. In view of the immensity of the territory and of the most diverse conditions of the different parts of the country, one would naturally expect a great variety in the courses of study in order to make the subject matter of instruction more suitable to the local conditions and to make the schools more serviceable to the community. But, on the contrary, the curricula for the primary and Middle Schools have been drawn up by the Ministry of Education for the whole country without any variation whatever. Furthermore, the text-books of all these schools, particularly those used in the higher and lower primary schools, must be approved by the Ministry of Education. Since the publishing companies in China are very few in number, there is not very much choice in selecting the text books, even if one wishes to do so. The reason for this

is largely due to the lack of trained men in educational service and the indifference of those in the teaching profession. The principals of the different schools are usually men of no educational training whatsoever and do not know how to adjust the curricula to the needs of the community. The teachers of the different subjects are usually indifferent or even opposed to the changes in the subject matter of their instruction, because it is much easier for the inadequately trained teachers to use an old text book than a new one. So there is very little hope that a great change can be made in this connection, unless we have better trained men and women in educational service.

From the following tables of the courses of study of the primary schools, we may first notice that a great deal of time has been given to moral instruction. The content of this subject consists largely of the ethical principles of Confucius and other ancient sages. It seems to the writer that at least a part of the time devoted to this subject has been wasted, because the emphasis has been placed entirely upon instruction rather than training. Children of the primary school age can not be expected to understand the ethical code laid down by the ancient philosophers. Furthermore, to know is one thing, but to do is another. Children who have a good knowledge of moral precepts may be just as bad and unruly as they would be otherwise. This subject will be discussed again in another part of this paper.

TABLE I
COURSE OF STUDY OF THE PEOPLE'S SCHOOL

Subjects	Periods Per Week			
	1st Grade	2nd Grade	3rd Grade	4th Grade
Morals	2	2	3	3
Chinese	10	12	14	14
Arithmetic	5	6	6	5
Handwork	1	1	1	1
Drawing	..	1	1	2 (1)
Singing and Gymnastics	4	4	4	4
Sewing	..	..	(1)	(2)
Total	22	26	29 (30)	29 (30)

(The figures in brackets denote deviations in the girls' schools.)

TABLE II
COURSE OF STUDY OF THE HIGHER PRIMARY

Subjects	Periods Per Week		
	1st Year	2nd Year	3rd Year
Morals	2	2	2
Chinese	10	8	8
Chinese Classics	3	3	3
Arithmetic	4	4	4
Chinese History	1	2	2
Chinese Geography	1	2	2
Nature Study	2	2	2
Handwork	2 (1)	2 (1)	2 (1)
Drawing	2 (1)	2 (1)	2 (1)
Singing	2	2	2
Physical Culture[1]	3	3	3
Agriculture[2]	..	2	2
Domestic Science	(2)	(4)	(4)
Foreign Language[3]	..	2	2
Total	32	34 or 36	34 or 36

(The figures in brackets denote deviations in the girls' schools.)

Another feature which is worthy of notice in the courses of study of the primary schools is the number of periods per week. In the upper grades of the people's school, children have to attend thirty classes a week, while in the higher primary, the pupils are required to attend about six hours a day including Saturdays. It seems to me that a good deal of time may be saved, if the subject matter is well chosen and the weekly schedule is better arranged. However, it is beyond the scope of this paper to go into any lengthy discussion of this subject.

When we look into the courses of study of the boys' and girls' middle schools, we are again struck by its rigid character. No choice is offered to the students. Everything is arranged for them and there is nothing corresponding to the elective courses found in the secondary schools of other countries. The following are the two tables showing the weekly schedule of the middle schools.

[1] For boys, military training takes the place of gymnastics.
[2] This course is provided for boys only.
[3] This is an optional course.

TABLE III

COURSE OF STUDY OF THE BOYS' MIDDLE SCHOOL

Subjects	Periods Per Week			
	1st Year	2nd Year	3rd Year	4th Year
Morals	1	1	1	1
Chinese	7	7	5	5
Foreign Language	7	8	8	8
History	2	2	2	2
Geography	2	2	2	2
Mathematics	5	5	5	4
Biology	3	3	2	..
Chemistry and Physics	..	..	4	4
Civics and Economics	..	..	..	2
Drawing	1	1	1	2
Manual Training	1	1	1	1
Music	1	1	1	1
Military Training	3	3	3	3
Total	33	34	35	35

TABLE IV

COURSE OF STUDY OF THE GIRLS' MIDDLE SCHOOL

Subjects	Periods Per Week			
	1st Year	2nd Year	3rd Year	4th Year
Morals	1	1	1	1
Chinese	7	6	5	5
Foreign Language	6	6	6	6
History	2	2	2	2
Geography	2	2	2	2
Mathematics	4	4	3	3
Biology	3	3	2	..
Chemistry and Physics	..	..	4	4
Civics and Economics	..	..	..	2
Drawing	1	1	1	1
Manual Training	1	1	1	1
Domestic Science and Gardening	..	2	2	2
Sewing	2	2	2	2
Music	1	1	1	1
Physical Culture	2	2	2	2
Total	32	33	34	34

Regarding the curriculum in the normal schools, we find there is a great similarity between that for the boys and that for the girls. For the boys' normal schools there are two courses of study: course A is of four years and one year in the preparatory class. The subjects of instruction are ethics, education, Chinese language, Chinese penmanship, English, history, geography, mathematics, biology, physics and chemistry, civics and economics, drawing, manual training, agriculture or commerce, music, and physical culture. Course B is only of one year. The subjects of instruction are: ethics, education, Chinese language, mathematics, biology, physics and chemistry, drawing, agriculture, music and physical culture.

The curriculum for the girls' normal school is very similar to that for boys except that agriculture is omitted and domestic science, gardening and sewing are added. The number of recitations is slightly larger than that required in boys' normal schools, but English may be omitted in case the conditions warrant it.

The higher normal school is divided into three courses: preparatory, regular and research. The subjects of study for the preparatory course are ethics, Chinese, English, mathematics, logic, drawing, music, and physical culture. A regular course is offered in the following departments: (A) Chinese language; (B) English; (C) history and geography; (D) mathematics and physics; (E) physics and chemistry; and (F) biology. The research course consists of the intensive study in two or three subjects of the regular course.

The organization of a university is more or less similar to that of the American and European universities, so that there is no necessity for its description here.

Statistics: According to the unpublished statistics obtained from the Ministry of Education, China has at present over 134,000 modern schools of different types, including normal industrial and technical schools, colleges and universities. There are approximately 4,500,000 students, 326,000 teachers and administrative officers, the annual educational expenditure of the central and provincial governments about $40,000,000. These statistics show a very remarkable development of modern education ever since the establishment of the Republic, in spite of the unsettled conditions of the country. But since the detailed reports are not available I shall present the statistics compiled in 1916 in the following tables:

TABLE V

SUMMARY OF THE EDUCATIONAL STATISTICS OF 1916

Kinds of Schools	No. of Schools	No. of Students	No. of Teachers	No. of Administrative Officers	Expenses
People's School	118,952	3,700,604	155,759	111,382	$14,325,695
Higher Primary	7,862	386,358	27,685	12,561	8,273,717
Industrial School of Class B and similar schools	1,711	53,104	3,255	1,455	782,318
Middle School	444	69,770	5,061	2,125	3,917,950
Normal School	211	27,975	2,399	1,007	2,731,209
Industrial School of Class A and similar Schools	455	28,710	2,447	1,185	2,192,460
Higher Normal	10	2,357	285	154	800,791
Colleges and Professional Schools	94	25,373	2,086	730	3,882.072
Total	129,739	4,294,251	198,976	130,799	$37,406,212

TABLE VI

PEOPLE'S SCHOOL OR LOWER PRIMARY

Name of Provinces	No. of Schools	No. of Students	No. of Teachers	No. of Administrative Officers	Expense	Expenses Per Student
Peking	216	21,073	421	173	$ 82,730	$ 3.92
Metropolitan District	1,154	30,026	1,264	1,239	188,590	6.28
Chili	14,288	423,537	15,298	17,597	1,418,415	3.34
Fengtien	5,489	195,983	6,473	1,577	1,372,093	7.00
Kirin	758	31,522	1,077	416	340,061	10.78
Heilungkiang	967	28,537	1,120	77	286,515	10.04
Shantung	14,375	395,490	17,207	22,138	1,299,290	3.05
Honan	7,325	185,649	8,738	6,866	395,413	2.13
Shansi	10,817	304,283	12,031	8,680	737,677	2.42
Kiangsu	5,845	262,735	10,934	4,169	1,704,129	6.48
Anhui	1,135	41,139	1,831	888	225,139	3.48
Kiangsi	3,026	91,761	5,099	2,743	407,239	4.19
Fukien	1,150	51,184	3,229	1,651	359,703	7.02
Chekiang	6,621	288,644	12,760	5,206	1,448,237	5.01
Hupei	9,118	216,582	9,681	3,858	456,729	3.04
Hunan	3,861	121,264	6,456	3,318	609,020	5.02
Shensi	4,913	121,176	5,594	7,017	244,558	2.04
Kansu	1,414	34,494	1,440	540	54,428	1.57
Sinkiang	53	2,602	76	.....	42,523	16.34
Szechuan	13,832	436,017	16,542	9,959	1,060,202	2.43
Kwangtung	4,093	161,003	7,504	5,798	1,163,503	9.99
Kwangsi	1,506	48,665	2,037	1,188	389,253	8.00
Yunnan	4,678	167,954	5,417	4,185	470,704	2.86
Kueichow	1,411	54,292	2,591	1,755	183,395	3.37
Jehol	464	10,686	480	281	48,344	4.52
Suiyan	262	5,925	272	11	21,705	5.55
Charhar	181	4,381	187	52	13,100	3.99
Total	118,952	3,736,604	155,759	111,382	$15,022,696	$ 4.12

TABLE VII

HIGHER PRIMARY

Name of Provinces	No. of Schools	No. of Students	No. of Teachers	No. of Administrative Officers	Expense	Expenses Per Student
Peking	61	4,030	316	181	$ 171,782	$ 42.62
Metropolitan District	54	2,091	108	83	58,311	27.38
Chili	405	25,808	1,097	730	667,014	25.84
Fengtien	351	20,102	1,015	282	540,077	26.86
Kirin	88	4,024	243	78	199,172	49.49
Heilungkiang	65	2,759	163	76	163,471	59.25
Shantung	381	16,078	883	598	369,780	22.99
Honan	224	12,594	360	395	236,757	18.79
Shansi	225	13,788	764	297	241,877	17.54
Kiangsu	458	26,625	2,314	930	751,377	28.22
Anhui	253	10,024	1,018	309	246,312	30.22
Kiangsi	421	19,474	1,459	581	345,605	17.74
Fukien	489	14,536	2,160	1,050	318,817	21.93
Chekiang	720	31,143	3,072	913	667,561	21.43
Hupei	182	13,158	673	300	253,385	19.23
Hunan	341	21,126	1,476	590	348,621	16.50
Shensi	140	7,917	460	264	173,880	21.96
Kansu	139	4,227	316	226	82,289	19.46
Sinkiang	6	147	10	.....	14,029	95.43
Szechuan	835	44,280	3,284	1,467	744,481	16.81
Kwangtung	1,100	45,998	3,938	2,150	990,675	32.31
Kwangsi	330	12,766	954	410	269,038	21.07
Yunnan	318	21,446	949	384	219,888	10.25
Kueichow	235	10,639	860	509	147,897	13.90
Jehol	1	907	50	30	29,137	32.12
Suiyan	7	374	16	9	7,069	18.90
Charhar	13	297	27	19	15,415	51.90
Total	7,862	386,358	27,985	12,861	$8,273,717	$214.13

TABLE VIII

MIDDLE SCHOOL

Name of Provinces	No. of Schools	No. of Students	No. of Teachers	No. of Administrative Officers	Expense	Expenses Per Student
Peking	12	1,820	181	81	$ 138,804	$76.26
Metropolitan District	6	732	61	23	70,660	96.53
Chili	25	5,502	282	129	367,184	66.73
Fengtien	19	2,658	119	38	128,400	48.30
Kirin	7	778	92	25	55,178	70.92
Heilungkiang	3	294	18	10	38,715	131.98
Shantung	14	2,263	126	44	102,402	45.25
Honan	15	3,040	149	80	148,421	48.67
Shansi	19	2,656	155	72	112,847	42.48
Kiangsu	23	4,339	350	143	331,337	76.36
Anhui	11	1,520	116	73	93,165	60.95
Kiangsi	15	2,296	198	68	122,764	53.46
Fukien	20	2,432	268	108	142,188	58.46
Chekiang	24	4,919	351	170	282,095	57.32
Hupei	23	2,337	260	79	208,446	56.77
Hunan	36	5,387	435	170	242,723	45.05
Shensi	6	1,244	67	55	74,539	59.91
Kansu	4	672	35	17	35,631	53.02
Sinkiang	....	.....	.....	....	.....	....
Szechuan	64	11,090	782	311	469,050	42.29
Kwangtung	49	6,796	534	228	378,116	51.73
Kwangsi	24	2,944	204	78	131,172	44.52
Yunnan	13	2,030	181	65	86,435	42.57
Kueichow	8	1,513	103	41	124,920	82.56
Jehol	2	215	12	6	13,237	61.56
Suiyan	1	192	7	6	10,000	52.08
Charhar	1	92	5	5	9,521	103.48
Total	444	69,770	5,091	2,125	$3,917,950	$56.15

Looking into the above tables there are a few very significant features which can not escape our attention. First of all, we shall notice the large number of administrative officers. In Table 5 we find that the number of teachers in the people's school or lower primary was 150,759, while the number of administrative officers was 111,382. Again, the total number of teachers of all the schools was 198,976, while the total number of administrative officers was 130,799. The writer can not very well understand the necessity of employing such a large number of administrative officers for the schools, particularly for the lower primary. Granting that the social conditions in China are rather different than those in foreign countries, such a large number of administrative officers is out of proportion in comparison with the number of teachers. There can be only two explanations for this. The first is the inefficiency of the educational administration. As a race we Chinese have to learn a good deal about modern efficiency. In China we find a very large number of officers employed in every line of government service, yet the inefficiency of the Chinese government is startling, if not inconceivable. It is reported that the number of men employed in the Ministry of War in China is about five times that employed in the War Department of the United States, yet when the accomplishments of these two respective institutions are considered China has no comparison. I suppose this same atmosphere of inefficiency has crept into the school administration. It is rather common to find that a large number of administrative officers in the schools do not keep their office hours nor even go to the schools regularly. One man's work is usually taken up by four or five or even more. So a great many changes are needed along this line.

The second reason for this large number of administrative officers may be explained by the fact of nepotism. It has been the custom in the Chinese government that when a man comes to a new office, all his friends and relatives flock to him to secure subordinate positions. This is also largely true in the government schools. It is not uncommon to find that when a new principal of a middle school takes up his position, a large number of the teachers and administrative officers of the former administration will be changed. So as a rule, the position of a principal of any kind of government schools is that of an official and consequently the corruption of official-

dom is inevitable in the educational administration. Unless we can take education out of politics, no real progress can be expected.

The second feature worthy of notice in the above tables is the small number of middle schools. According to the report of the Ministry of Education of 1916, we find only 9,999 graduates from the middle school in that year. This is especially significant when we consider the development of college education. In recent years both the government and the private individuals who are interested in education have made their efforts to establish universities. With the present circumstances of the middle school it seems to the writer that all these efforts are premature, if not wasted. The problem for them is how to get qualified students for collegiate work. It would have been much better, if the energy and money which have been spent for the so-called universities had been spent for middle schools. The writer is not opposed to the establishment of universities but it is rather a question of time when we take the whole country's educational condition into consideration.

Another thing which we must bear in mind in the study of the statistics is the large number of schools established and supported by private enterprises. This is shown in the two following tables:

TABLE IX

PRIVATE SCHOOLS

Kinds of Schools	No. of Schools	No. of Students	No. of Teachers	No. of Administrative Officers	Expenses
Lower Primary.....	35,156	954,642	45,628	27,077	$3,695,610
Higher Primary.....	1,897	66,058	6,507	3,224	1,250,235
Industrial School of Class B and similar schools.....	122	4,232	385	191	91,893
Middle School.....	59	8,622	850	298	498,883
Normal School.....	13	629	154	64	47,540
Industrial School of Class A and similar schools.....	22	2,204	199	77	111,763
Higher Normal.....	.....	.....	.....	.....	.....
Colleges and Professional Schools.....	34	8,649	722	295	987,732
Total.....	37,303	1,045,036	54,445	31,227	$6,683,656

TABLE X

GOVERNMENT SCHOOLS (NATIONAL AND PROVINCIAL)

Kinds of Schools	No. of Schools	No. of Students	No. of Teachers	No. of Administrative Officers	Expenses
Lower Primary.....	83,796	2,745,962	110,131	84,305	$11,130,085
Higher Primary.....	5,965	320,300	21,178	9,337	7,023,482
Industrial School of Class B and similar Schools.....	1,589	48,272	2,870	1,264	670,425
Middle School.....	385	61,148	4,211	1,827	3,419,067
Normal School.....	198	27,346	2,245	943	2,683,669
Industrial School of Class A and similar schools.....	433	26,466	2,248	1,107	2,080,697
Higher Normal.....	10	2,357	284	154	800,791
Colleges and Professional Schools.....	60	16,718	1,364	635	2,894,300
Total.....	92,436	3,250,615	144,531	99,572	$30,722,516

One may wonder from the above tables whether there is any government control or supervision over these private institutions, especially, since there is such a large number of private lower primary schools. But as far as I know, there is very little or no government regulation in this connection. There is no standardization of the different kinds of schools whatever. Any private individual or corporation can establish schools of any kind without government sanction, or even recognition. However, the private schools usually follow fairly closely the regulations and curricula proclaimed by the Ministry of Education. In many cases the private schools are better managed, equipped and offer a better education. The reason for this is that in the private schools there is less corruption than is found in the government institutions.

Regarding women's education we may say that it is just beginning. From the statistics for 1916 we find in the whole country that there were only 3,766 schools for girls with 180,949 students in comparison with 125,973 schools for boys with 4,113,302 students. The annual expenditure for girls' education was $2,202,279 while that for the boys' education was $35,203,933. Furthermore, there was no institution above the middle school for girls, except a few women's colleges under the Foreign Mission administration. Very recently the government established a Girls' Higher Normal School in Peking, but its success remains to be seen. So far we have dealt with the statistics of the schools under Chinese administration. Now we may have a brief description of the mis-

sionary schools. According to the unpublished report received by the writer from the Board of the Educational Board of the Protestant Foreign Missions in China, we find the following data:

	Schools	Pupils
Lower Primary	5,400	140,777
Higher Primary	176	31,247
Middle Schools	273	14,713
Normal Schools	61	686
Colleges	27	1,745
Theological and Bible Training Schools	87	No Record

From the Catholic Missions the data are very incomplete. According to the available information, we find that there are 4,281 schools with 84,435 students and 42 colleges with 4,482 students. These figures include both boys and girls. Besides these there are also 46 seminaries with 2,435 boys or young men who are learning Latin and aiming at priesthood.

As a rule both Protestant and Catholic Schools have a special aim in view. Their emphasis is religion and they offer better training than most of the government schools. Unfortunately, they have not placed very much importance upon the study of sciences which seems to be the dominant interest of the Chinese young men and women at present.

II. Educational Problems to be Solved

In the previous section I have tried to describe the present educational conditions in China, but I have refrained from any lengthy discussion of the various phrases of the problem. Now I shall try to indicate briefly some of the problems to be solved.

Universal Education: The first educational problem confronting China to-day is to provide school facilities for a population of 400,000,000. The problem is so gigantic in scope and so complicated in its character that its solution can not be expected in the immediate future. Ever since the Republic, the problem of universal education has been supported by all the intelligent citizens of the country, but the progress towards its realization has been rather slow. In order to show the degree of deficiency in this phase of the Chinese national life, I may bring the educational statistics published by the United States Bureau of Education for the year 1916 for comparison. According to the said report we find that the total number of pupils in all the schools in the United States during 1914 was 22,462,342, while the total enrollment of the elementary school was 19,561,292. Considering the population of the United States for that year as 100,000,000, we see that

about 20% of the entire population were enrolled in the elementary schools and about 22½% were attending one kind of school or another. If we use this proportion as a basis for the discussion of the Chinese educational problem, we can easily see that our school enrollment is far behind what it should be. We should have an elementary school enrollment of 89,000,000 instead of 3,700,604 and a million elementary schools instead of 118,952. What a difference between what it should be and what it is!

Again, most of the modern schools are found in large cities, while in the rural district we may not find a single school for an area of tens of miles. This is the condition which the writer has personally found during his traveling into the interior last summer. But even in large cities the deficiency in educational facilities is surprising, if not unbelievable. Take for instance, the city of Tientsin, one of the largest cities in the northern part of China, with a population of 950,000 according to the census collected by the city police commissioner, but had only 9,049 pupils attending the primary schools in 1918. If we assume that the number of children of school age should be 20% of the total population, then the school enrollment should be 190,000. Consequently, only 3.7% of the school population were attending schools in this metropolis. It is also interesting to notice that of this total number of school children 5,849 were boys and 1,200 were girls. The number of boys in the lower primary was 4,411 and that in the higher primary was 1,438, while the number of girls in the lower primary was 1,052 and that in the higher primary was only 148. We must also remember that this number of school children include those in the private schools as well, so we may summarize our educational statistics for this city as follows:

GOVERNMENT SCHOOLS FOR BOYS	
a. Number of pupils	4,680
b. Number of teachers	167
c. Annual expenditure	$93,821
GOVERNMENT SCHOOLS FOR GIRLS	
a. Number of pupils	983
b. Number of teachers	35
c. Annual expenditure	$24,535
PRIVATE SCHOOLS FOR BOYS AND GIRLS	
a. Number of pupils	1,386
b. Number of teachers	46
c. Annual expenditure	$15,538

Tientsin is in many respects a modern city, yet it is so backward in modern education. One can easily imagine what would be the educational conditions in those cities which are not so fortunately situated as Tientsin, and in the rural districts where modern influence has not penetrated. It seems that the task of providing educational facilities for such a great population is so overwhelming that China will not be able to have a universal education in the next few decades without foreign assistance. The problem of education in China is a world problem, the solution of which will not only enhance the welfare of the people in the Far East, but will also benefit the people of the whole world of which China is only a part. I can not resist from appealing to the disinterested and altruistic philanthropists throughout the world to share this burden with China so as to develop the possibilities of this fourth of the globe.

School Finance: The most important factor in solving the problem of universal education is school finance. The estimated cost of education in the United States in 1914 was $794,459,968, while the total expenditure of education in China for 1916 was $37,406,212 (silver). The total amount expended for public schools by the different states of the United States for 1913-1914 was $555,077,146, while that expended by the Chinese central and provincial governments for all the schools in 1916 was $30,722,516 (silver), as shown in Table X. Furthermore, the expenditure per capita of total population for public schools in the United States of the same year was $5.62, while that of China was about 7½ cents. The reason for this small amount of money expended for education in China is that a large part of the national revenue has been spent for the maintenance of military organizations. China is spending about 70% of her annual income for her so-called army, which is large enough to cause endless hardships for her peace-loving people but is valueless in her defence against any foreign encroachments. The most unfortunate thing is that the Chinese people are not strong enough to throw off the yoke of this militarism and to insist on the government spending the money for their benefit. During the recent financial crisis the first to suffer and that which suffered most was the school. In Peking as well as in other provinces the teachers of the government schools sometimes do not receive their salary for three or four months.

This has brought a great hardship to the teachers, particularly those in the primary schools. It is not infrequent to find teachers' strikes for their delinquent pay. Many schools

have been compelled to be discontinued or temporarily closed due to the lack of funds. Just a few days ago the Girls' Normal School in this city was ordered by the educational authorities to discontinue its classes for fifty days. It is rumored that all the primary schools of this city will have to be closed until further notice. All these odds and ends will make the darkest period in the history of modern education in China. China is committing suicide if she allows such conditions to continue.

Now, what can be done in view of these conditions? It seems to me that there can be two ways to solve this financial problem. The first is the curtailment of her military expenses, and the second is to levy a general tax for education. To accomplish the first involves the disbanding of a large part of the Chinese army, but this can not be done without foreign pressure and supervision under the present circumstances, and this again involves the national honor and the patriotic sentiment of the Chinese people. I feel that it is time to sacrifice our national sentiment in this particular respect, in order to get rid of this great menace to the peaceful and orderly development of the country. Regarding the second method, it has loomed large in the minds of the Chinese educators since the Republic. In some provinces the increase has been made on the rate of local taxes for educational purposes, but on the whole the increase has been very slight. We Chinese people have not realized that education should be supported by taxation. To tax the rich for the education of the poor will meet the inevitable opposition from the general public, but opposition or no opposition, the principle of taxing the people according to what they have and providing them with educational facilities according to what they need should be put into practice.

Training of Teachers: Closely connected with the problem of universal education is the problem of getting a sufficient number of competent teachers for the service. From Table V we find that the number of teachers employed in 1916 was 198,976, but only about one-half of them had received some sort of normal school training. The great majority of the primary school teachers had never entered a class room as students before they took up their teaching profession. Most of the high school teachers are either graduates from mission schools or have taken a short cut course of normal school training for three months or half a year. It is an exception rather than a rule that they can teach. The writer was personally told by a Commissioner of Education of one of the

interior provinces last year that he could hardly select a half dozen qualified persons throughout the length and breadth of that province to be the principals of high schools. It is really pathetic sometimes to see how bright and conscientious boys have to be instructed by the teachers who have no training nor ability nor interest to teach. However, it is not the fault of any individual or institution, but the general educational condition of the country has made such a situation inevitable.

Generally speaking, the supply of teachers comes from two sources, the mission schools and the normal schools. But the supply is far below the demand, so there is practically no competition whatever in the teaching profession. Institutions that need teachers usually have to be satisfied with whomever they can get and have no choice on their part. As a result of this, incompetent and unqualified teachers have found their way into schools. This condition will not be changed until the shortage of teachers is overcome.

Furthermore, the difficulty of getting teachers will be greatly increased when more schools are established. As I have stated before, China should have about 80,000,000 children in the primary schools, if education becomes universal. According to this estimate we should have 2,000,000 teachers for the primary schools alone. But where can we get this supply? The Ministry of Education reported from 1916 that there were only 4,446 graduates from the normal schools and 368 from the higher normal. From Table V we find that we had 27,975 students in the normal school and 2,357 in the higher normal in the year 1916. From this meager source of supply it is almost impossible to hope that the problem of getting a large number of teachers to meet our demand can be solved in the years to come.

Another factor for this increasing difficulty of getting teachers is that the teaching profession is not attractive to the ambitious young people. Hitherto the normal schools have attracted young men rather of inferior quality. Even the graduates from the normal schools have entered other fields of enterprises and refused to go into teaching because there are many opportunities in China which promise a bright career to the intelligent and ambitious young people. The writer has personally experienced the difficulty in getting teachers for the college with which he is connected because most of the best trained men who have received their education in the large European and American Universities are not willing to go into educational service. It is reported that a very wealthy Chinese merchant in the southern part of China who has

devoted his entire fortune of approximately $10,000,000 to establish a university, has to postpone the opening of the institution due to the failure of getting teachers for the work. Those who have the responsibility in educational administration will have similar experiences in this connection.

As we have mentioned before there are quite a few normal schools for girls, but we find very few girls or women in teaching or in school administration. It is very strange to see that the government did not insist upon the graduates of the girls' normal schools to serve a few years after their graduation since their education has been entirely free and their training is particularly adapted to this service. The reason for this desertion of the girls' normal school graduates from the teaching profession is that most of the girls who enter the normal schools come from the very wealthy homes and they have no intention to teach after having obtained their own education. Unless some radical changes be made in the administration, I feel that the girls' normal schools should be discontinued for the present and more middle schools for girls should be established, so that those who have no intention to teach should pay for their own higher education.

From the above brief description of the various phases of the problem regarding the training of teachers, we can clearly see that it is a problem whose solution requires the highest intellect, patriotism, and a spirit of sacrifice on the part of the young people, who are in a position to serve. Unless this problem is solved, there is no hope for a universal education.

School Discipline: Besides the various problems stated above, there is another disturbing feature in our modern education, that is, the tendency toward insubordination on the part of the students. During the recent years student strikes and even riots are not of infrequent occurrence. The chief reasons for these are the wrong conception of liberty, the mismanagement of schools, the spirit of unrest during this transition period and the bad training of home and school.

Ever since the Republic, the young people have shown a tendency to unruliness in every aspect of social life. They have taken liberty as license and freedom as the absence of any social control. Very unfortunately this tendency appears to be very strong among the students of the higher schools. Frequently the students have taken the management of the schools into their own hands and refused to recognize the proper authorities of the school. They always take the advantage of their collective groups and try to dictate to the educational workers what and how they should do in dis-

charging their duties, and to the teachers what and how they should teach. Teachers who take a firm stand in dealing with the students are frequently boycotted or forced to give up their positions. On this account the administrative officers and teachers of government schools usually take the laissez-faire policy and let the students do what they please. As an illustration of this tendency I may state that the system of final examinations has been practically abolished by many institutions. The writer has observed the agitation for the abolition of examinations in the past two years, and he inevitably finds that the agitators are students of poor scholarship. The argument they have advanced is that since the examinations serve only as an instrument for testing the book knowledge, and since the book knowledge is useless without practical experience, so the examinations have no justification for existence. One can easily see the faulty logic of their argument and the underlying reason for their agitation. The worst phase of this whole situation is that most of the school teachers and administrative officers do not have the courage or intelligence to check this movement.

However, sometimes the teachers and administrative officers are at fault. Their indifference towards the improvement of the school and their incompetency in doing their duty have often invited the disobedience and disrespect from the students. Sometimes the corruption of the school administrators has been such that their expulsion by the students through strikes is in many respects justified.

Another reason for the difficulty in maintaining school discipline is the spirit of unrest in every aspect of our present social life. Many social reformers have tried to change the social conditions by preaching to the young people the importance of the questioning attitude or the attitude of doubt. But they have been misunderstood and have brought about results contrary to their intentions. Instead of social reformation through the evolutionary process, they have hastened the time of social disintegration. They have misjudged the ability, education, and the intelligence of the younger generation and will, probably, do more harm than good in their attempt at social reform.

The last but not the least cause for the unruliness of the students is the training they have received from the home and schools. As mentioned before, the Chinese schools have placed more emphasis upon moral instruction than moral training. This also is true with their home education. We teach the children the moral precepts without insisting upon their prac-

tice. This opens again the question of the Greek philosophers, "Can morals be taught?" In the light of the principles of educational psychology, we feel that it is training, not instruction, which brings the desired result in this aspect of education. Most of the pupils in the schools have never been trained along the line of right conduct, so it is almost impossible to hope that the schools will have an easy task in maintaining discipline.

Now what is the remedy for this whole situation? It seems to me that there can be two ways to handle the situation: The first is to take strict measures against any violations of the school regulations. Pupils who show any disobedience to the school authorities, teachers as well as administrative officers, should be severely punished or expelled. Any leniency in handling the situation will increase the tendency of insubordination already prevalent among some students. The second remedy for this situation is to put the administration of schools of higher grade on a military basis. The training given by the American academies is needed by all our young people. The moral qualities of cleanliness, courage, obedience, promptness and truthfulness can all be instilled in the students by military training. We must remember that our first duty is to train good citizens for the Republic. Under the present circumstances such an aim of education can not be accomplished without adopting such measures.

To sum up, I may say that the modern education in China is still in its infancy. The problem of providing educational facilities for a population of 400,000,000 and under such peculiar circumstances is so immense, and complicated that it can not be solved in the immediate future. In many respects the results of our effort in introducing modern education have been very disappointing, but I would like to suggest to all our Chinese educators to bear in mind the proverb, "If there is a will, there is a way."

CHILDREN'S FEARS

By Henry S. Curtis, Ph. D.

Children have many more fears than adults, and these fears are much more insistent and terrible. They arise largely from the weakness of the child, and from that vague emotional tendency which always peoples the unknown with monsters. The happiness of many a child is largely wrecked by these fears, and one of the great problems of the mother is preventing them from arising in the first place, or overcoming them as they appear.

It may be said that fear serves a useful purpose, in keeping the child out of danger. This seems on the surface to be so, but a careful examination of children's fears shows that they have little relationship to present dangers, and are adapted to a period so remote in human history that they have little to offer under present conditions. There are certain wise fears which every child should have. He should be afraid of automobiles, and of fire, and of children's diseases, but few children fear these. He may learn to be cautious about going across the street, but this is not to be compared with the fear of bears, or lions, or the dark, that haunt his sleepless hours at night.

It may seem to many that courage is no longer a fundamental need, inasmuch as most of the dangers of past ages in the way of savage animals and savage man have been conquered and life has been made more and more safe. However, there probably never was an occasion since the world began when there was greater demand for heroic qualities than in the World War, which has just passed. On the whole we may confidently expect that life will physically become more and more safe as the years go by. This will not mean, however, that there is much less need of those qualities of mind which find their physical expression in feats of daring. Without courage no man is willing to take risks in business, or to undertake anything new. He does not dare to make investments; he is afraid to speak out for the right; he never ventures to champion a new cause, or fight persistently for a principle. The conditions of courage and the type of courage change with the centuries, but that fundamental quality of mind is no less necessary now than formerly. Without courage no one has self-confidence or poise, or aggressiveness.

It is quite possible for one to have daring and aggressiveness in business or politics, and still be timid in a physical encounter, but in general the two types of courage go together, and without this quality of mind, it is almost impossible for one to be successful in business or politics, or any of the larger undertakings of the present which involve dealing with men, or the control of industry.

The Evils of Fear

Fear is a serious evil. The child who is constantly afraid often fails to grow and develop as he should. He never has complete peace of mind, his sleep is often troubled by nightmares, is lighter than it should be, and is often disturbed. During his studies also, these fears lie in the background of his mind, and prevent full devotion to work. They make spontaneous play almost impossible. Occurring through long periods, they often result in neurasthenia or yet more fundamental nervous disorders.

Worry is only the outward expression of lack of confidence in one's self or of fear in regard to the future. Complete courage prevents worry.

The Causes of Fear

Experience: The common belief is that experience is the source of fear. The old proverb says: "The burned child dreads the fire." Nothing is farther from the truth. The child who has been burned learns to be careful about putting his hand into the fire, but he has no fear of it in the sense that he fears the boogies which haunt the dark of his own room. There are no fears of importance in childhood which grow out of experience, and its fears have almost no relationship to actual dangers.

Instinct: Most fears of children are instinctive. The first fear is usually that of being left alone. The child realizes in a vague way his helplessness, and that his very life is dependent upon the adults who are about him. Nature has given this fear to all her little children in order that they may keep close to the mothers.

All fears are increased by solitude, and company always adds courage. This comes to us from our gregarious ancestors, and makes us feel the strength of the herd or the pack when we are with them, while we have only our own strength to depend upon when we are alone. Soldiers will charge across an open field in a body, though then much more exposed to gun fire, where they would not dare to go alone.

The fear of the dark is an almost universal fear, although the child tucked in his bed at night is almost absolutely safe; far safer than at any other time, and is only threatened by fire, of which he is usually not afraid. Many say that this is an artificial fear which has been given the child through the terrible stories which have been told him. It is doubtless possible to bring a child up in such a way that he will not fear the dark. Nevertheless, it only takes a very slight occasion for this fear to appear, thus showing a natural tendency. If it is prevented, it must be by the use of much caution. The reason for this fear is obvious. All instincts develop as such only through the habits and daily life of the race, followed through generations of time, consequently all instincts and emotions are adapted to ages long back in racial history. There was a time when the dark held all the monsters which the child's imagination yet beholds, when the lion and the tiger, and the cave bear, and yet more savage man, lay in wait, and did their hunting in the dark. After the day has gone, and the darkness comes upon us, the nervous system still vaguely feels their dread.

There is a quality in the imagination which causes it to conjure up all sorts of strange and terrible forms in those places where sense does not deny their existence. Thus we find that the unknown world that surrounded the known world of Greece and Rome, was peopled with griffins and centaurs, dragons, and all sorts of fabulous monsters, so childhood quite as easily peoples the darkness of its own chamber with boogymen and other monsters.

All fears are increased by the dark, and tend to be dispelled by the light, which is true not only in the physical, but also in the intellectual sense. The secret fear which the child keeps to himself is much more terrible than any fear which he will confess. The mother must not laugh, but lead him to tell her fully.

Another wellnigh universal fear is the fear of snakes, though probably not one person in ten in America has ever seen a poisonous snake in its natural habitat, and snake bites do not cause one one-thousandth of one per cent of our death rate. There was a time when the great tree snakes were the most dangerous enemies of our arboreal ancestors, and in fact almost the only enemies from which they could not escape by climbing a tree, or running out upon a branch. Many will remember the story from Kipling's Jungle Book of "Kaa's Hunting" also of Bimme, the bad orang-outang who could be conquered only when his keeper hissed like a snake, when

he cowered in his cage and trembled with fear. There is apparently no explanation of our fear of snakes that is not older than human history.

The fear of lightning is another almost universal fear, which is scarcely represented in our mortality lists. It is not a great danger, but it is terrible on account of its vividness and on account of the earlier association with the belief that it was the expression of the anger of God.

Nurse Girls and Parents: While the great majority of fears are instinctive and the tendency to them is always present, the occasion of their appearance is usually some suggestion or example of fear from nurse girl or parent, or some terrible story is told to the child where the details are made vivid in order to add to the interest. The mind of childhood does not discriminate in regard to habitat. It does not realize that tigers are found only in Asia, and lions in Asia and Africa; that wolves and bears and panthers live in the great woods far from civilization, and they are feared by many small children in any wood lot through which they may go, and it seems not at all impossible to them that they should be hid in the closet, or under the bed, or in some dark corner.

When B. was three years old, she heard a large man snoring under a tree on Mt. Lowe, in California. She said to her mother: "He must be a giant, let's go to the hotel." Her mother said, "No, he is only snoring," but she said, "No giants don't snore, they roar like papa does when we play giant."

Parents often have little idea of the fears which torment the lives of their small children. This is an important reason for maintaining a close intimacy with them. Last night I was left alone with my small girl of six. We read a few stories and played one or two games and had a long talk. She finally said, evidently with much feeling: "If Mama should die, would you take care of us?" It came as an utter surprise to me, but I realized a little later that the mother of their little playmates had died about two years before, and evidently this fear had been in her mind all this time. I remember very well in my own childhood, when five years of age, one of our neighbors committed suicide, and I was tormented for two or three years by the fear that my father might do the same, and was always in terror if he did not appear at just the time when he was expected.

A little later she wished to go to the bathroom, and wanted me to go with her. I asked her why she wanted me to go and she said she was afraid of Indians.

When it came bed time, it developed that she was afraid of "booglers." I told her that burglars had never entered a house in which I was, during my lifetime, and that if they did come, they would not touch little girls; that they came only for money, or silver. She seemed much comforted.

She finally said: "In case it thunders, the bathroom or the kitchen is the safest place isn't it? because the lightning isn't so apt to strike you." Here were four fears, all of an intense nature, of three of which I had been entirely unaware.

Weakness: Many of the fears of childhood arise from its helplessness, its inability to take care of itself, and to meet with its own strength the dangers of which it hears. If the dangers which early childhood imagines were actually present, there would be every cause for fear. Anyone given to introspection will notice how his own courage in regard to the various emergencies of life rises and falls with his physical vigor, and that any period of sickness or physical exhaustion brings on a whole series of fears which have not been felt before, while with renewed vigor and energy all fears tend to disappear. Age which brings again the helplessness of childhood brings with it many fears, though of a different sort, not fears of bears, or boogymen, but of poverty, or decrease or loss of some cherished possession. Vigorous health is always one of the best antidotes against fear.

Wrongdoing: Many of the fears of childhood as well as of adult life spring from wrongdoing. The child does something which he has been forbidden to do, or which he knows is wrong, and in consequence is afraid of what his parents may do, or that God will punish him. There are many cases in which a load on the conscience of this sort leads to a real nervous breakdown in delicate children, and here we see the need of the mother's confessional, at which the child may confess his sins, and be given absolution.

Unpreparedness: After all, courage means mostly preparation. None of us care to encounter an opponent by whom we are sure to be overcome, to try our strength in some contest to which we are unequal. The child who has learned his lessons is not afraid of the examination, but the child who has spent his time in playing marbles or trading jack knives, may regard them with acute dread. The strong boy is not afraid of the weak one, but the weak boy may rightfully be afraid of any combat with a boy who is stronger than he. We have recently had an example of this principle on a world scale, where Germany had built up her preparedness to such an extent that she felt able to fight the world, and was not

afraid. The wise policy was well expressed by Roosevelt, "to speak softly, but carry a big stick." It is worth while to be strong and agile even though we do not wish to fight, for the security and peace of mind which it gives, for the weakling is never secure from tormentors, and the only way he can have that sort of reliance and confidence that every child should have is to be reasonably able to take care of himself. The child who is able to swim is not afraid of the water. The woodsman is not afraid of the woods, the lion tamer does not dread the lion. It appears that when put to actual test many of the desperadoes of our own West have been the veriest cowards. They were able to pull a gun and shoot so quickly that the other fellow stood no chance. It scarcely required any courage for them to hold up the coach, or to shoot another man under these conditions. The dangers we are prepared to meet, we do not fear. Fear furnishes one of the deepest motives for effort. The progress of man and of the individual has consisted largely in the successive conquest of his fears.

Courage and Sex: Courage and sex are closely associated. Where our domestic animals are unsexed, they always lose their aggressiveness, and are easily mastered by those that have not been unsexed. The greatest aggressiveness of the male is always shown in the mating season, and courage, aggressiveness, and self-confidence are among the qualities which we always speak of as masculine.

Girls are more subject to fear than boys, and in the study of G. Stanley Hall, printed in the *American Journal of Psychology,* Volume 8, out of 5,037 fears, it appears that the boys studied averaged 2.21 fears, while the girls averaged 3.55, and that the girls are not only more afraid of animals and what might be considered as real dangers, but they are also more afraid of death and of the end of the world.

Throughout biological history, the female is in general somewhat less aggressive and pugnastic than the male, except at those times when she must defend her young, when as ever, "perfect love casts out fear." Girls are shown in all studies to be more timid than boys. Whether or not this is an unchangeable characteristic we cannot tell, but if so it is probably the most fundamental psychological distinction between boys and girls, and is the primary reason, perhaps, why women have never succeeded as well as men in invention, or business, or politics. They have always been less willing to take chances, and have tended to be conservative both in theory and in practice. How far this has been the result,

however, of their more secluded lives, and how far it is an inherent difference, the future must decide.

Overcoming Fear

What can the mother do to prevent fear in her children, or to help them to overcome these fears, should they arise? In this as in all other things, example is more vital than precept, and an important contribution which every mother should make is to show the child that she is not afraid. She should be careful about suggesting to the child that he is afraid, for fear like all other emotions is very subject to suggestion. She should say "Johnny is a brave boy, I know he is not afraid to do this." If this is repeated often enough, it is almost sure to be effective.

If the child is nervous and timid, the mother must temper the story somewhat to the child's sensitiveness, and take off a little from the terror of the bears and wolves and the robbers and giants who infest the fairyland of childhood, for she must remember that the world in which the child is living is much more this world of fairy tales than it is the workaday world of hers.

There is only one way to overcome fear, and that is to face it. The dangers we hide from, or run away from, become thereby the more terrible, and also the more dangerous, because there is an instinctive trait in the whole animal world to pursue the thing which runs away, to stop before the thing that stands still, and to retire before the thing which advances upon us. Our running increases the courage of our opponent, and decreases our own. The danger that we face always seems much less terrible than it did when we tried to put it out of our minds. It is said that the women who looked down on the battle from the city wall were always much more afraid, and suffered more than their sons and husbands who were fighting on the plains below. This is certainly true of life in general. When we are in the midst of the combat, we forget the danger, and in many experiences of life where immediate action is required, we do not realize the danger until after it is passed. There is a beautiful illustration of this principle in the recent novel of H. G. Wells, "The Research Magnificent." Benham is afraid of the bull, and on this account he determines to cross the field in which the bull is, and all through life he makes it his guiding principle that he will face each danger, will do the thing he fears to do, and as soon as this impulse is acted upon, the fear and the danger largely disappear.

Great care should be taken to see that the children are not frightened or given conceptions which are a little too terrible for their nervous organization, but when fear has once come to the child's mind, the only successful way of dealing with it, is to face the fear. Take the child by the hand and lead him into the dark corner where he thinks the bear or Indian is hiding, and show him that it is not there.

Developing Courage

Courage has developed in the race through the long struggle for survival. During most of his time upon the earth, man's life has been in jeopardy every day, and ofttimes many times a day, and practically all individuals met with a violent end. So the great school of courage is to-day a no less personal contest which finds expression in rivalry and fighting, but most perfectly, perhaps, in our great team games. Baseball and football offer almost identically the same opportunities for the development of courage and resourcefulness in the presence of an emergency, which life has called for in the history of the race.

DEFECTIVE NUTRITION AND PHYSICAL RETARDATION*

By John C. Gebhart

The past three or four years have witnessed a growing interest in nutrition of children and renewed emphasis on the factor of weight and height in relation to good nutrition and sound health. Throughout the country nutrition classes and other methods of dealing intensively with defective nutrition are multiplying rapidly.

The society which I represent, the New York Association for Improving the Condition of the Poor, has, in a sense, been a pioneer in this field. As early as 1907 its Committee on the Welfare of School Children made an intensive study of defective nutrition the results of which were published in the Quarterly of the American Statistical Association, June, 1907. A few years later the Association assumed the responsibility for developing a school lunch system for New York City as one contribution toward the problem of defective nutrition. In 1916 it engaged the services of Mr. Frank A. Manny to make a thorough study of the entire problem. Mr. Manny's work did much to bring the problem to the attention of thoughtful people and to impress them with its seriousness. He also thoroughly canvassed the literature in this field and made it available to workers throughout the country. The Association was responsible for interesting Bellevue Hospital, Bowling Green Neighborhood Association and others in establishing nutrition clinics in this city. Since 1917 it has been engaged in very intensive nutrition work as a part of its intensive child health program which it is carrying out in a congested district of 40,000 population.

Stimulated by what private organizations were doing in the field of defective nutrition, the Board of Education of this city last year purchased a hundred scales for the regular weighing of school children. The Child Health Organization reports that largely as a result of its propaganda one-fifth of the schools of the country are now provided with scales.

Commendable as all of this work is we find it accompanied by a great deal of confusion as to what is the normal rate

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of growth for children, of the relation of height and weight to nutrition and of accurate methods of periodical measurements of growth.

Two height and weight standards are most commonly used. The Holt-Burk-Boas standard is a combination of the averages of a series of measurements by Holt of children from birth to 5½ years at intervals of three months with the averages of measurements compiled by Burk and Boas for children from 5½ to 17½ years of age at intervals of one year. Based on the average yearly increment of children over 5½, Manny has worked out interpolations of 3 month intervals. The A. I. C. P. is using the Holt-Burk-Boas table with Manny's interpolations. The other standard most commonly used is that worked out by Dr. Thomas D. Wood which gives an array of weights for each age placed opposite heights ranging consecutively from 39 to 72 inches.

Still another norm has been prepared by B. T. Baldwin based on measurements of approximately 1,500 boys and 2,500 girls from six to eighteen years of age. They are not generally used because the children were measured without clothes and are of a selected group composed entirely of private school children. The Baldwin table is, therefore, of little use as a standard for observing public school children drawn from the general population and among whom nude measurements are seldom practicable.

A careful comparison of the various modifications of the Holt-Burk-Boas norms with the Wood's norms reveals discrepancies of from one half to six pounds. For those who expect to find an infallible normal weight for any child these discrepancies have been most troublesome. The extreme convenience of the arrangement of the Wood's tables has led many, including the National Child Health Organization and the U. S. Bureau of Education to accept them and to urge their adoption throughout the country. The A. I. C. P. has thus far been disinclined to accept the Wood's figures because we have never been able either by consulting the original publication or by private correspondence to discover on what data they are based or how they have been computed. The A. I. C. P. has continued to use the Burk-Boas figures because they are based on the largest number of typical American children that has as yet been observed, because the original data has been frankly discussed by the authors in many publications, and because they have been compiled by recognized experts in the field of anthropometry.

Since height is usually regarded as less influenced by nutri-

tion than heredity and other factors the universal practice is to take the average weight for height as the normal. Those of us who use the Holt-Burk-Boas standards arrange the normal weights opposite the normal heights for the same ages. To determine the normal weight of a given child we read off the weight opposite the given height regardless of age. The expected gain, however, is computed on the basis of the average gain for a child of his age. Those who use the Wood's tables read off the weight to the right of the given height and below the given age. The expected monthly gains for various ages are given at the bottom of the table. They are about the same as those indicated by Burk and Boas. Unfortunately no measurements are given for children under 5 which bars out most pre-school children.

From this brief analysis of the methods commonly used it is clear that there is danger of assuming that the average height and weight of a large number of children is the normal weight for any particular child under consideration. This is the mistake which many lay workers and even physicians are making every day. In relating the height or weight of any individual to a general norm or average certain fundamentals of statistical method must be kept clearly in mind. First, the individual must belong to a racial, social and economic group comparable with that from which the averages are drawn. It is, of course, wrong to expect a child of Italian parents to conform with a standard made up of northern races, e. g., English, German, Scandanavian, Scotch and Irish. It is contended, however, that in taking the normal weight for height the racial factor is fairly well compensated for in that height is less affected by nutrition and more by heredity than is weight. It is likely that a scientific investigation of the subject will show that height is more affected by poor nutrition then many have supposed and that the racial factor is not therefore fully allowed for in taking weight for height rather than age. I shall speak more fully of the racial factor later.

Moreover, those who expect an individual to conform exactly to the average forget that variation plays an enormous rôle in all natural phenomena. There are normal variations both above and below the average or mean. A child may be either above or below the average height or weight and be a perfectly normal, healthy specimen. How much variation is permissible can only be determined by a careful scrutiny of the data.

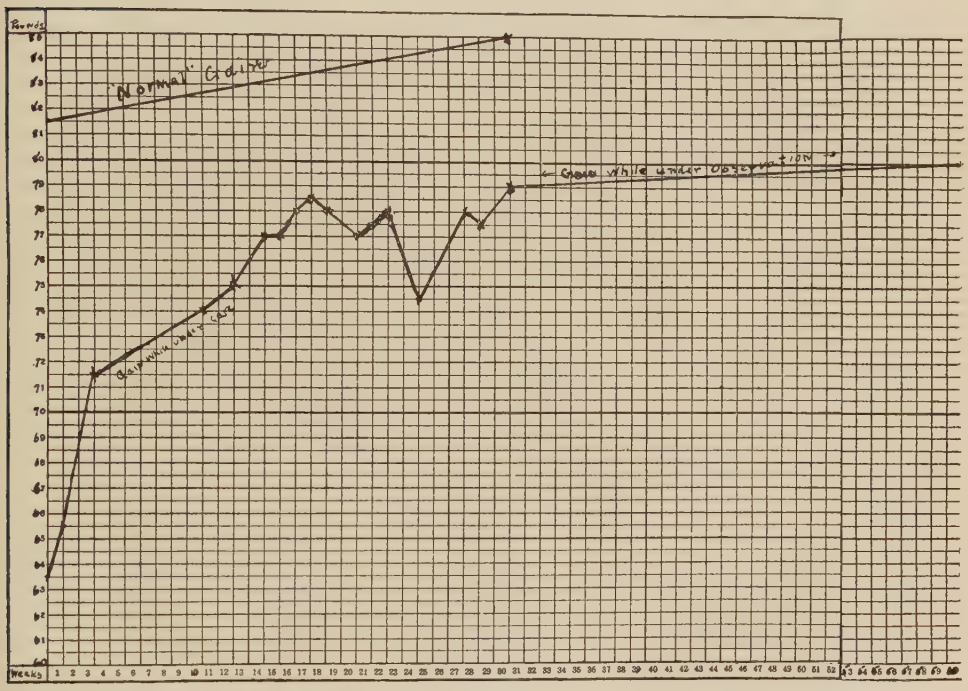
This fact is recognized by those who maintain, for example, that only those who are 7% or more underweight for height

are undernourished. Emerson and Manny in a recent article state that clinical evidence shows that a child less than 7% below the average or 20% above the average weight for height is within the zone of those of normal nutrition. While this is a recognition of the principle of variation we need to know of what this clinical evidence consists before accepting such an arbitrary adjustment of the variation factor.

In 1897 Boas pointed out that an average based on the measurement of entirely different sets of children at various ages involves a favorable selection of children at the higher ages since the younger age groups obviously contain many individuals who will die before they reach the older ages. The average for the younger ages are depressed therefore by the inclusion of many of the physically "unfit." This can only be overcome by repeated measurement of the same children throughout the entire period of childhood. The averages of Baldwin previously referred to were compiled by this method. The number measured, however, is too small to give us a satisfactory norm and is confined to a group living under very favorable social and economic conditions. Emerson and Manny recognize this difficulty and attempt to compensate for it by setting the Burk-Boas figures ahead a half year. Thus a child of seven would be expected to attain the weight of an eight-year-old child according to the Burk-Boas table. Again there is a recognition of the principle involved but the adjustment is entirely arbitrary.

After determining whether the child is above or below weight for height it is still necessary to determine the expected rate of gain for a given period. Since the age-weight factor has been disregarded in determining the normal weight for the child an attempt is made to allow for the age factor by computing the expected gain on the basis of age. For example, the girl whose measurements are recorded in the accompanying chart was 12 years old. She was 56¾ inches tall while the normal height for that age is 55½ inches. She was thus 1¼ inches over-height. Her normal weight for her height is 81.2 pounds while her actual weight is 63½ pounds. She is, therefore, 17.7 pounds or 22% underweight for her height. A girl of 12 should gain about 10 pounds in a year. In 7 months she should gain about 6 pounds. In this period during which she was under care she actually gained 15.5 pounds. She therefore made a gain of 221% of the normal or 121% in excess of the normal. But following the growth of this child beyond the period indicated in this chart we find that at the end of 14 months she had gained 4¼ inches in height. In

spite of the fact that she had gained 16⅓ pounds and was overweight for her age she still was 16% underweight for her height. At this point, however, she was brought to our diagnostic clinic for examination and Dr. Schroeder diagnosed her nutrition as normal despite the fact that she was still much underweight for her height. It will be noted that this girl was more than 3% over-height for her age in spite of the fact that she is an Italian and that the Burk-Boas norms are generally too high to be applied to Italian children. It will



also be observed that she was in the period of rapid growth for girls which falls in the years between 11 and 13. I have given this case as an illustration of how our present methods of observing the growth of individuals falls down. If time permitted I could also give cases of children who were much under-height but whose gains according to this standard had been most satisfactory and yet they gave every physical evidence of being undernourished.

The problem of computing the expected gain for relatively

short periods (3 months or less) is still further complicated by the factors of seasonal variation and of the change in weight of clothing with seasons. Early studies have indicated that the highest rate of growth falls in the period from May to the middle of December and that during the winter months there are comparatively slight gains and in the spring months practically no gains. Porter in 1920 compiled the gains of 1,226 boys in Boston public schools in monthly intervals for 10 years. His results indicate that the greatest gain takes place from June to December. The gain during this period is about 3 times as great as the gain during the balance of the year which includes the late winter and spring months. Porter's results would have been much more convincing, however, if the measurements had been made without clothes, for, obviously, the period of greatest gain is also the period during which heavier clothing is worn. The weights, however, were taken with indoor clothing only and the change of weight in such clothing is not sufficient to account for the seasonal variation which Porter finds. Unless gains are recorded for a full year it is necessary to make allowance for the seasonal variation.

Such difficulties as this, met with in our daily work, led us to become sceptical of the height and weight standard as the sole index of nutrition. Our procedure now, while still observing carefully gains in height and weight, is to look more and more to the physician's diagnosis to determine whether the child is undernourished. All children are first examined by the physician for all physical defects. His diagnosis of defective nutrition is based upon underweight for height; under-height for age; color of mucous membrane; general musculature, and the presence or absence of subcutaneous fat. Those diagnosed as undernourished are kept under the observation of the nurses and dietitians for about 3 months. Those who do not make satisfactory gains are brought back for further diagnosis and study. Those who are apparently doing well are still kept under observation but receive less intensive care. In this way we shall keep all cases under observation for about a year.

It is becoming increasingly clear that defective nutrition and physical retardation are two different things, although closely associated. Defective nutrition and the many diseases which are encountered in childhood are a frequent cause of retardation. The child's nutrition can be improved in a relatively short time by good food, country outings, adequate periods of rest and play and the observation of general hygienic

rules. The child's retardation which may be the result of a long period of undernourishment responds much more slowly and probably in most cases is never entirely made up. While it is comparatively easy for a well trained physician to diagnose defective nutrition and to note improvement, retardation can be only determined, if at all, by repeated measurements of the same individual for a long period and these measurements must be carefully checked with the normal measurements of the social and economic group to which the child belongs.

The danger of presenting a curve of normal growth for a large number of children is that it implies a uniformity of the rate of growth which seldom exists. Analysis of a large number of individual curves of growth shows that children of normal or accelerated growth enter their period of rapid growth earlier than those of retarded growth. This has been shown not only for height and weight but for lung capacity, pubertal development and even mental development. So clear is this tendency that it is claimed by many that we must speak of children in terms of physiological and not chronological age. In other words, the physically retarded child is in every respect, except chronologically, a younger child than an accelerated child of the same age. There are also important differences between boys and girls in the rate of physical development. Boys exceed girls in height and weight up to about 10 years of age when girls overtake and surpass them; later the boys again overtake the girls and surpass them. Boas has shown that girls are from a half to two years ahead of boys in the ossification of the carpal bones and in the eruption of teeth.

It is obvious from such considerations that there are important variations both with respect to age and sex for different physiological phenomena. Boas has worked out the mean square variability with respect to chronological age as follows:

This table strikingly demonstrates that variability of physiological phenomena increases steadily with chronological age.

In view of the complexities of determining retardation we are convinced that we need a new set of standards applicable to the children with whom we are dealing. The anomaly of comparing the rate of growth of children of southern Italian stock with the northern races which make up the Holt-Burk-Boas norms is obvious. The first step is to devise a norm made up from a group racially and socially comparable to the one with which we are dealing. We have already weighed and measured more than three thousand children and are adding to this number at the rate of from 150 to 175 children

Age	Observations	Variability
0.0	Pregnancy	± 0.04
0.6	First incisors	± 0.21
1.6	First molars	± 0.31
4.2	Ossification of scaphoid bone, girls	± 1.4
4.2	" " trapezoid bone, girls	± 1.2
5.8	" " scaphoid bone, boys	± 1.1
6.2	" " trapezoid bone, boys	± 1.3
7.0	Inner permanent incisors, girls,	± 1.6
7.5	Inner permanent incisors, boys	± 1.4
8.9	Outer permanent incisors, girls	± 2.1
9.0	Bicuspids, girls	± 2.8
9.5	Outer permanent incisors, boys	± 2.1
9.8	Bicuspids, boys	± 1.6
11.2	Permanent canines, boys	± 1.4
11.3	Permanent canines, girls	± 1.0
12.7	Beginning of pubescence, boys	± 1.6
12.8	Second molars, girls	± 1.6
13.2	Second molars, boys	± 2.0
14.6	Completed pubescence, boys	± 1.1
14.9	Puberty, girls	± 2.0
19.3	Wisdom teeth, boys	± 2.1
22.0	Wisdom teeth, girls	± 1.8
35.0	Preauricular wrinkles	± 6.6
36.5	Hair on tragus	± 8.3
44.5	Menopause	± 5.3
62.5	Death due to arterial diseases, men	±13.2

each month. With these data we ought to be able to devise norms and to compute variations and correlations which would give us a fair standard for assessing the retardation and acceleration of the children of this group.

The heredity problem, always a difficult one, is partially solved by confining our measurements to children of one race. But within any racial group there are divergent heredity types. We shall probably be able to check up on this to some extent by securing the heights and weights of many of the parents. We may thus be able to work out some correlation between the rate of growth of the children with the growth attained by their parents.

Dr. Boas has been good enough to interest himself in our problem and has consented to supervise the collection of the data and the necessary computations. First we shall need to find the mean height and weight of the children according to age and sex and thus provide a satisfactory general norm. Besides this we shall probably need to compute the variability both with respect to height and weight for boys and girls for each age. On the basis of such computations we shall then be able to work out a correlation of weight and height for age which would enable us to substitute a scientific and reliable procedure for what must now be largely guess-work.

These steps seem to us fundamental. Besides these, however, there are other indices of physiological development which if carefully observed and tabulated would make our procedure even more certain. As I have already indicated such phenomena as the eruption of teeth, the advent of puberty and the ossification of the epiphyses are important milestones of retardation and acceleration. With respect to the eruption of teeth, particularly permanent teeth, we are now in a position to collect reliable data. In this district we are conducting a school dental program which provides for the cleaning, filling and extraction of the teeth and the charting of the mouth of all of the children in the first five grades of school. From this data we should be able to correlate this important development with height and weight. From the doctor's physical examination we might also be able to collect significant data regarding pubertal development. The expense involved in providing the X-ray or fluoroscope makes the recording of data as to ossification much less practicable but not altogether impossible.

The relation of physiological to mental development is as yet a virgin field. Such observations as have been made have been based on school grade or marks or on the general impression of the teacher as to the child's mentality. What we need is a survey of a group of children by approved psychological tests to determine exactly the child's mentality. There is reason for believing that the backwardness and dullness of many children is really a manifestation of physical retardation. If the causes for their retardation can be removed, many of these children will respond by accelerated mental as well as physical development.

Such a procedure if successfully worked out for Italian children would prove of great value to nutrition workers throughout the country. By this I do not mean that the norms and correlations derived for this group would be applicable to every group but that a clear-cut procedure as to what data are needed and how they are to be handled for dealing effectively with retardation here, would clear the way for a greatly improved technic throughout the country. We are, therefore, desirous of enlisting the co-operation and support of all scientific men whose opinion in this field is essential, the anthropologist, the anthropometrist, the statistician, the physician, and the educator.

INTELLIGENCE CLASSIFICATION AND MENTAL HYGIENE

By Garry C. Myers

In the splendid work being done by the mental hygiene organizations there are some obvious difficulties which have confronted most of their efforts up to the present time. With few exceptions there has been an emphasis on individual testing and the individuals tested have been those who as a rule have been brought before the clinicians because those individuals did not fit properly into the school program, because they gave trouble at home or because they did not properly fit within their social environment. These clinicians have been able to do a great deal after diagnosing these cases, by removing remedial physical difficulties when present, and in advising or directing the education of these children. In a few instances, among these children have been found those who are especially bright; but because of this method of selecting the cases to be tested the exceptionally bright children who have thus far received examination have been very few in number.

It would seem that the real opportunity for the most effectual work in mental hygiene would be the making of a complete survey of whole cities somewhat after the fashion of the army intelligence surveys. By this method one of the several well established group intelligence tests would be given to all children and those children rating below a certain minimal point would be given an individual examination. Likewise of course all other children whose conduct seems to warrant more elaborate testing would be examined. By this method there could be made a registry of all cases within a given city that needed special care within the school or were objects of institutional care. This of course should be done in connection with the public schools. In time, then, for all the people of a given community there would have been placed a record of their intelligence rating which would be of valuable service to the courts of justice and in relief work, as well as in all industrial and business organizations. Indeed the intelligence ratings of men and women applying for marriage licenses would be a matter of record whereby there could be an effectual control for the elimination of the propa-

gation of the feeble minded. This does not mean that the intelligence examination would be given just prior to the application for a marriage license but the whole scheme would provide that the intelligence rating of this or that individual would be on file by the state or local authorities which would be taken when those individuals entered the public school.

Just how would this scheme work out? In the first place there would be a complete intelligence survey which could be done within a very few days by the school authorities, of all the children of a public school system. Those children ranking low in this group survey would be given an individual test by expert psychologists wherever possible. Then the school would be reclassified on the basis of this intelligence rating. For example, supposing the number of children for each of four classes of grade one was determined to be about 25; then those 25 children with the highest intelligence rating would be placed in the bright class, those 25 with the lowest rating in the dullest class and the other children in classes proportional. It should be noted that instead of the raw scores the most reliable rankings would be on the basis of intelligence quotients, that is, on the basis of the raw scores divided by the chronological age of each child. Once the school were thus classified within each grade those children who progressed more slowly or more rapidly than their grade would indicate would receive special examination and special observation. Once the entire school system were thus established only those children entering school would need to be tested. Therefore in the course of time all the people within a given community would have registered an intelligence rating of them.

Of course this scheme presumes a nation wide system of such classification and intelligence ratings, if it is to be so perfect as eventually to include all the individuals of a given community. Needless to say such an ideal will undoubtedly be reached in the not far distant future.

Now the practical advantages in terms of mental hygiene. This scheme of classifying the learner on the basis of intelligence has been worked out in detail by the writer as Director of Education at the Recruit Educational Center, Camp Upton, N. Y. There, to the most casual observer, it is obvious that the intelligence tests do pick out groups on the basis of their ability to learn. A complete statistical study of the efficiency of this system is being worked out, in the absence of which it is needless to say that intelligence tests do prophesy learning ability to a wonderful degree of precision. Because of

this relatively accurate classification on the basis of learning capacity the effect on all learners concerned is obviously very salutary. In the first place the bright men are given a chance not only to advance more rapidly but to learn much more. Thrown in among men of like ability they are stimulated to do their best and they do not have the inducement to develop habits of laziness and indifference which bright learners often do develop in the traditional class. Many a child with real genius has not shown progress as a pupil in school and many a child has failed even to keep up in his class chiefly because he had so much capacity that the smallness of the task in his class and the monotony of the program which did not make demands on his mental storehouse often led that child to lose respect not only for the learners in his class of inferior ability but for the task which these learners had before them. Consequently such bright children have developed a real dislike for school and have either quit school early or have been the objects of trouble and discipline and of worry for their parents and teachers. When one reads the biographies of great men one does not always find a manifestation of intelligence in terms of school progress of such men during childhood. On the other hand if such children would have been given, on their first day of school, an intelligence test there is no doubt but that their genius would have been recognised and that their teachers would have found ways to make their school more attractive. Perhaps, then, the greatest contribution by the method of classifying on the basis of intelligence is to the bright child, the children of the upper 5 or 8 per cent on the score of intelligence, from whom come the leaders of the community.

Then there is to be considered the child of average intelligence who, to keep up with the brightest children, must strive too hard and must often lose courage in the struggle. Among these average children there are many very industrious ones who are stimulated by their zealous parents, friends or teachers frequently to overwork in attempting to stand high in their class and to rival other children with native capacities far above their own. In the absence of a rating of these children, and by the old traditional method of classification, the teacher and parents of such unfortunate children take it for granted that such children must have high native capacities chiefly because they wish them to have such capacities. Such children thus not properly known by the teacher and the parents become often nervous wrecks and break down. No doubt the large number of nervous children whose ill health is

attributed to the strenuous program of the school would never fall victims to such ills were they put with other children of similar capacities; certainly the number of such ills would be reduced. One of the most pathetic things that one can observe is to see children overzealous about their school standing. On the other hand there are many children, who by the traditional method of classification are not worked up nearly to their capacity and who merely waste their time because their genius is not found, nor are they confronted with school tasks commensurate with their capacities.

Furthermore, there is to be considered the very low child, intellectually. This child in the regular class of his grade can not keep up. He becomes discouraged. When promotion time comes he is left behind; at the next promotion maybe, he is left again, or pushed on with the hope that he may get something in a new environment. Thus in the traditional school system, except in a few schools where these low grade children are segregated for special instruction, the teacher must expend a lot of time and effort looking after these unfortunates. They, furthermore, break down the morale of the class and the teacher. They rob the children with better capacities of the time which they ought to have from the teacher and are a constant worry to the teacher; consequently the teacher's efficiency is impaired, the morale of the class is lowered and the whole class efficiency must suffer loss.

Of course the writer does not want to leave the impression that there are just three types of children. These terms are used merely in a relatively rough way. On the other hand the writer believes, as plenty of available data indicate, that there is a wide and rather gradual distribution of intelligence, and that so far as possible in the school within a given grade children should be classified so that those relatively of the same intelligence rating should be placed together. He believes furthermore that in any such class there will always be wide differences and that there will be relatively bright and relatively dull children within any class, that is, relative in term of the individuals in that class.

To reiterate, classification on the basis of intelligence in its immediate effect upon school children will mean a higher mental efficiency for all children than can be produced by the traditional method. It will mean especially a more rapid development of the brighter children. It will mean that children of all grades of intelligence will be happier, that there will be fewer worries by the teacher, parent and child, and that especially there will be a decrease in the number of chil-

dren who become nervous because of their anxieties about their school progress. In the larger field it eventually will furnish the state and local authorities with data whereby they can produce a higher social efficiency by furthering the welfare and happiness of the community, by control of marriages and by furnishing of means whereby the lowest scale of intelligence will discontinue to multiply. It will furnish data to aid in all works of relief, in work of policing and in the administration of justice. In short, such a scheme should contribute mightily toward the mental health and wealth of the community.

STAMMERING STUDIES

By Ernest Tompkins

The recent appearance, under the name of one of our great universities, of a study of stammering which is wholly erroneous in its fundamental conclusion, suggests an appreciation of a preceding study which is unique for the great proportion of truth which it developed. This creditable study is John Madison Fletcher's "An Experimental Study of Stuttering" published in the *American Journal of Psychology,* April, 1914, Volume XXV, No. 2.

Since practically all of our knowledge comes from a slow and laborious process of subordinating the error to the truth, it is not only necessary to condemn the error but also to support the truth. There are many other reasons why an appreciation should be written. The general prevalence of the error causes cruel and extensive suffering; careless and illogical contributions which contribute to that suffering should be discouraged; and careful and beneficial work should be encouraged.

Since the appearance of Fletcher's Study a completely satisfactory (and, therefore, necessarily acceptable) view of stammering has been developed; so we have a standard by which to judge Fletcher's conclusions. In order to facilitate comprehension of the merit of many of those conclusions, they will be quoted and then compared with what is now reliably known of the disorder.

The logical, and almost necessary, preliminary to a study of any subject is the reading of its literature. In the case of stammering that preliminary necessitates the wading through of a mass of dreary speculation and unwarranted conclusions which generally mislead even a cautious reader. One may peruse an ostensibly original discussion and be comparatively sure that he will find incorporated in it some of the classic myths with which he is familiar. Fletcher showed the independence of the true investigator in appraising those old views at their worth. Illustrations of this will be given farther on in the discussion.

In order to understand Fletcher's clear vision it will be well to outline the view of stammering which has been developed since he made his study. The disorder is frightened interfer-

ence with normal speech; and it constitutes a complex, self-intensifying habit, namely a mental habit of entertaining fear of speech difficulty, which prompts a muscular habit of making misdirected, obstructive efforts to avoid that imaginary difficulty, and which in turn intensifies the fear. In short, the stammerer has no real speech difficulty: he obstructs his speech by his panicky efforts to avoid an imaginary difficulty.

Automatic and Conscious Speech. Fletcher says: Stammering ("stuttering," used by Fletcher, is not the correct term for the disorder) . . . "seems to take place more readily in those organs whose functioning is too complex to admit of direct representation in consciousness" (p. 237).

Comment. This shows accord with the view reached, evidently independently, by Dr. Liebmann that stammering is conscious interference with automatic speech. Although other investigators than these had noted that speech is not wholly a consciously directed action, Liebmann seems to be the first to recognize that normal speech is so thoroughly automatic that a conscious speech effort, especially about the time of speech acquisition, is likely to conflict with it owing to lack of conscious knowledge of how we speak. And Fletcher shows some comprehension of that. The facts seem to be that speech is gradually acquired by conscious trials, which develop into automatic actions which proceed merely with the volition to speak. Under ordinary conditions these automatic actions become so secure that they are not readily upset; consequently stammering develops in advanced life only under severe inducing causes. But during the period of a few years after speech acquisition, an attempt to talk under conscious direction, especially a frightened attempt, results in a conflict between automatic speech and the misdirected conscious effort, and this conflict is the stammering spasm. So Fletcher progressed far toward a great discovery which most of the investigators since then have been unable to grasp, even when it has been clearly explained to them.

Inducing Cause. Fletcher tells of a man whose utterance of the word "preliminary" was interfered with by a dental harness which he was wearing. He was embarrassed by the interference, has since feared that word and stammered on it. Fletcher then says, "The genesis of stammering through imitation, may, in the writer's opinion, be accounted for on the same principle" (p. 231).

Comment. Although, two years after this opinion was printed, Dr. Makuen wrote, "The problem of finding a causal factor which is common to all stammerers . . . remains

unsolved," we have here the perception that a temporary interruption to speech is an inducing cause in the particular case cited, and the opinion that such is the principle involved in the cases arising from imitation. This really constitutes an undeveloped discovery of the common causal factor; for if Fletcher had proceeded to prove his opinion in its application to the cases arising from imitation he would undoubtedly have noticed that the principle extends to all cases.

Continuing Cause. Fletcher quotes Makuen, "Many persons stammer under certain conditions, largely because they think they will. All their past experiences with speech have combined to confirm in them the thought and it soon becomes a sort of fixed idea," and confirms this by the observations, . . . it has been found that the presence of certain states of mind is a constant attendant if not an antecedent of stammering. The writer's opinion is that these are antecedent and causal, (p. 229), and ". . . . the factors that determine the difficulty in all cases" (consonants, vowels, etc.), "seem to be not the nature of the sounds themselves but the mental experiences undergone by the stammerer in his attempts at pronouncing them," (p. 221).

Comment. The fear of speech difficulty is the continuing cause of stammering, so these three observations are correct. It is true that the stammerer entertains the idea that certain sounds are difficult for him, and thereafter they appear to be so, for the thought of difficulty prompts the misdirected effort which makes the difficulty; but he disproves that the difficulty is in the sound itself, for he will struggle desperately to say "Yes," and, after producing nothing but struggles will give up in disgust, remarking with perfect fluency, "Damn it; I can't say 'Yes.'" Even when he is saying it he thinks he can not say it. What could be more evident than that it is the effort—not the word—which is the difficulty?

Again, Fletcher says, "One of the subjects, W. N., acquired a persistent tendency to stammer in pronouncing a particular word in consequence of one unsuccessful attempt to give a number while going through his regular test in counting from one to twenty. To instruct him to be on his guard when he came to that number seemed each time to furnish a positive suggestion to stammer" (p. 244).

Comment. Here again we have the memory of a failure causing renewed failure. Yet it is the universal custom in the attempts to cure the stammerer to attract his attention to his difficulty, and thereby to intensify it ultimately. The teacher observes the patient to find out what sounds he fears or asks

him what sounds he fears, and then drills him in the pronunciation of those sounds, thereby bringing them still more forcibly to mind and encouraging still more forcible effort to say them, and consequently still more abject failure. But the practice is so profitable on account of the temporary relief afforded, that no amount of exposure of the injuriousness of it seems sufficient to stop it.

Misdirected Efforts. Fletcher: "The writer has observed acts of . . . opening the mouth, . . . pressing the tongue against the roof of the mouth, pressing the lips against the teeth, and pressing the lips together" (p. 224).

Comment. Fletcher here describes some of the misdirected efforts which block normal speech and produce the paroxysm. Let any one try to talk while pressing the lips together, and he will find himself to all appearances stammering. He lacks only the fear which would make him a real stammerer. If the experiment is tried by a child whose speech is not firmly fixed the fear will develop and the case will become a genuine case of stammering arising from imitation. Fletcher seems not to have observed the obstructive effect of these misdirected efforts, but he certainly observed the efforts.

Nervousness. Fletcher says, "The writer is of the opinion that in general the permanent condition of nervousness that is thought to be characteristic of stammering should be regarded as effect rather than cause" (p. 248).

Comment. Here again Fletcher's observations prevailed over the almost universal opinion that the stammerer is constitutionally neurotic. The disorder—rather, the humiliating attention which it attracts—is a constant irritation, and it is perfectly natural for a human being to become nervous under constant, humiliating irritation.

Absence of Stammering in Concert Reading. It has long been known that stammering disappears during concert reading or reciting; but Fletcher's instrumental demonstration that the disorder is allayed in two stammerers when they read together is as pleasing for the originality of the experiment as it is for the results. These results, however, are what our present knowledge of the disorder would lead us to expect. Stammering is allayed when the fear of speech difficulty is subdued. During the reading of a stammerer in concert with a fluent person, the stammerer fears no difficulty, for he knows that the continued reading of the fluent person will distract attention from himself. Similarly, when two stammerers are reading together, each one evidently composes himself with the assurance that neither will have difficulty

at the same time; and, each being composed, makes no convulsive effort to avoid stammering, and consequently does not stammer.

Now that we have by comparison both elucidated the rational views of stammering and also shown Fletcher's more or less complete grasp of those views, it will be of interest to note how many of the generally accepted errors he declined to endorse.

Heredity. There are few writers on the subject who do not endorse the heredity of stammering. Either they present one of the alleged proofs of heredity or blindly accept those which have been presented by others. Fletcher takes them for what they are worth. He says, "The facts so far known seem only to warrant opinions rather than definite conclusions regarding the inheritance of the defect; and the opinions differ" (p. 247.) Indeed, the facts which have developed since those words were printed indicate not only that stammering is not inherited but also that it can not be. For instance, the period of freedom from stammering during speech acquisition would dissipate any idea of speech difficulty, even if such an idea were inherited. In interesting contrast to Fletcher's impartiality in his work is the action of that more or less well-known authority, who when he heard of this bar to the inheritance of stammering—of which he was a prominent advocate—revised some previously published histories which he had given as showing the appearance of the disorder after speech acquisition and made them show appearance of the disorder with the beginning of speech! That was certainly taking the bull by the horns.

Psychoses. From the earliest history of the disorder right up to the present day the stammerer has never been free from the charge—often delicately veiled—that he is mentally deficient. This cruel slander runs all through the literature of the subject, and it is nearly as rife to-day as it was when the dense ignorance and barbarity of the race was some justification for it. The allegation—there has never been a proof—of mental deficiency ranges from a definite lesion to an illogical idea. The stammerers owe a debt of gratitude to Fletcher for the simplicity and truth of these two statements which deserve to become classic, "The subjects are not to be distinguished physically from other people" (p. 203), and "their thought processes are logical" (p. 203).

Structural Defects. Malformation theories are numerous. One day on the train I was discussing stammering with a physician whom I happened to engage in conversation, and,

although he was not familiar with the disorder, he insisted vehemently that by all rules of neurology there had to be a defective nerve; and not long after that I met on the same train another physician who had renounced regular practice for Chiropractic, and he told me very positively that stammering is caused by constriction of a nerve or nerves in the region of the neck and that he has cured it by relieving the constriction. But Fletcher says, and says truly, "The causation of stammering by imitation also seems out of accord with the structural explanation of the defect" (p. 247). If the mere imitation of dialect would damage a nerve or dislocate one's neck, why is stammering the only dialect which produces those disastrous results? And why, oh why, can only one investigator in a hundred see that a disorder which is contracted by casual indulgence in a particular manner of talking can not be due to a structural defect? And yet our great institutions for the advancement of knowledge are grinding out this inexcusable ignorance.

Tics. Fletcher made short work of the tic theory. Enough said.

Breath. The stammerer's manner of breathing is a hackneyed subject for discussion. One celebrated authority is on record to the effect that the stammerer never takes a full breath; and most authorities insist that he is more or less advanced in pulmonary tuberculosis. Fletcher says, "Ten Cate . . . found that the stammerer is not below the normal in chest expansion . . . and his lung capacity is not below the average" (p. 207.) Certainly. Once speech is acquired there is only one requirement for the origin of stammering, and that requirement is a temporary interruption sufficient to induce a conscious speech effort. The imputation to the stammerer of ". . . adenoids, tonsils, nasal intumescence, enuresis nocturna, general hypertonia with bad bodily carriage (winging scapulae, relaxation of abdomen, great lombar incurve), shallow upper chest, traces of past rachitis, large eating, palpable lymphatic glands, bronchitis, various forms of habit spasm, cardiac leaks and irregularities, certain stigmata; less frequently, epileptiform attacks, mental or moral insufficiency; and, constantly, evidence of large thymus or block in that area," all these constitute merely an effort to account for a misunderstood disorder. If this effort is scientific—and its author solemnly avers that it is—then Fletcher's effort, which is as far superior to it as the heavens to the earth, leaves little to be desired in scientific procedure.

Fletcher observes further in regard to breathing, "Breath-

ing abnormalities seem to tend toward becoming stereotyped in certain forms for individual stammerers. These individual peculiarities are numerous and varied in character. They often appear as temporarily adopted expedients to help out in the beginning of speech, just as the stammerer will often be found to start himself speaking by uttering a vowel sound like 'ah'. Breathing peculiarities of this kind are too numerous and varied to admit of classification" (p. 217). This is a good description of the facts.

Aphasia. Fletcher properly discarded aphasia as a cause of stammering, giving it no consideration. His wisdom in this is singular in view of the present constantly recurring endorsement of the totally erroneous Bluemel theory and other theories of the aphasia class. No lesion has ever been connected with stammering and many manifestations of the disorder indicate that it can not be due to a lesion. The changes from obstruction to fluency are often instantaneous—altogether too rapid to be the effects of a lesion.

Psychoanalysis. Fletcher saw the fallacy of the psychoanalytic method as applied to stammering, and again in this he was ahead of both the time in which he wrote and the present time; for the following which it had then has rapidly extended since, so that now even in our public schools, which should be kept clear of mistakes, the searches for the stammerers' complexes accompany the inculcation of articulatory and breathing exercises. Perhaps we should find some consolation in this, for of the two, the exercises are positively injurious, whereas the psychoanalysis is merely ineffective; so the combination of the two makes the results average not so bad as formerly, and we should be thankful for small blessings. In this connection it is worth while to examine a quotation from Laubi which Fletcher gives, "For instance, if stammering should arise in a child as a result of being bitten by a dog named Schnauz, the emotional complex will be connected with the memory of that name; and the child thereafter will probably be found to stammer on all *sch* sounds." Notice the positive statement that the complex will be connected with the memory of that name, and then the qualified statement that probably the child will be found to stammer on the *sch* sounds; both of which are typical of psychoanalytic reasoning. It was comparatively safe to make the positive statement that the complex would be connected with the memory of the name, for who would gainsay it? or who could gainsay it sufficiently to counteract the numbers of persons who allege it? As to the child's stammering on all *sch* sounds, disproof of that might

be adduced, so the qualification "probable" was advisable in that connection. But why did not Laubi first verify this allegation of stammering on the *sch* sounds, and then make his statements as a matter of experience? That is the scientific method, and the method which reliable investigators must go to the pains to follow. We do not find Fletcher indulging in such unscientific speculation.

Let us analyze Laubi's flight of fancy. In the first place the emotional complex in the stammerer is a fiction. He has an emotion, but it is not a complex. It is a fear, perfectly justified, and therefore perfectly logical. It is not even the "fixed idea" of those who are not amenable to reason. His speech has been obstructed, he has been subjected to humiliation because of the obstruction, and in order to avoid repetition of the humiliation he makes a determined effort to speak the sound with which the obstruction was connected, and by that effort he causes the very obstruction which he meant to obviate. The whole procedure is eminently logical. And here we come to the alleged "fixed idea." If circumstances are favorable during the utterance of a word which is feared, then that utterance is fluent, and a few successive favorable experiences will convince the stammerer that the word which he formerly feared is really easy, and he will then use it until it is metaphorically threadbare. Where is the "fixed idea" now? In fact, the stammerer does not entertain "fixed ideas." The imputation of them to him is only the veiled insanity charge cropping up again. And here we come once more to Fletcher's clear vision. He says, "A study of such lists" (difficult consonants) "and several attempts to secure them from stammerers have led the writer to conclude that they are not the same for all stammerers, *and that they do not remain constant for the individual stammerer*" (p. 221). Before we go farther in this analysis we may well ask, where is the libido on which Freud bases his cult? What is there pleasurable in being bitten by a dog? or, what is there shameful in it, that it should be relegated to sub-consciousness for fear of the light of day, there to ferment a distemper? So far, we have shown that the stammerer's emotion is not a complex, but a simple fear; and that instead of constantly fearing a particular sound he may come to love sounds which he once feared.

Laubi's allegation that the child's stammering will always refer to the inducing cause is of importance, for it follows a line of reason which is as erroneous as it is popular. Here are samples:—a case of stammering arises from aphasia, therefore

stammering is a variety of aphasia; a case of stammering arises from nervous prostration, therefore stammering is a form of nervousness . Let us turn from this guessing to that superb statement of Dr. Bryant's, " In fact the cause or causes may have long since passed away but the effects remain as more or less of a mental or physical habit or both." With this fine generalization for our guide let us consider the subject. In those rare cases in which a person has experienced difficulty with one sound and has subsequently stammered on that sound only, Laubi would find some justification for his view that all the difficulty has an evident connection with the original difficulty; but such cases are only of academic importance. Even if the feared word was a commonly used word the social and economic deprivation consequent on stammering on only one word would be negligible. But that stammerer would probably be able to find an unfeared synonym for the difficult word, and then he would for all practical purposes pass out of the classification of stammerer, for he would no longer be heard to stammer and he would not seek treatments. On the contrary, in the vast majority of cases, even those such as the one cited by Rudolf Denhardt, in which the difficulty arose through doubt about the pronunciation of a word beginning with " p " in a passage which a school pupil was reading aloud, the doubt extends to other than the original difficult sound; and thereafter the doubt does not indicate connection with the original doubt, but shifts and changes according to subsequent experiences, generally having its marked connection with the most subsequent experiences. This obsolescence of the original experience and experiences, and predominance of the recent experiences is seen in the principle of recovery, namely the predominance of the effect of fluent speech over the effect of impeded speech. To understand this, grasp the fact that the stammerer's speech, being impeded only when he interferes with it, is to a considerable extent fluent. He has routine duties which dispel his fear of difficulty, and in the absence of that fear he is fluent. Now, let him decline to speak during those periods when the fear is on him, and the result will be that what speaking he does is all fluent. His speech experience then will consist of successes entirely. These successes gradually build up confidence in his ability to speak, and after a long time—in a confirmed case—the fear disappears. Then the impediment disappears, for in the absence of the fear, no misdirected effort is made,

and automatic speech flows unimpeded. In short, Laubi's fancy is nothing more than a fancy; and in general the application of Freudianism to stammering is not only discreditable to psychology and medicine, but it is also a gross injustice to those long-suffering stammerers whom it purports to benefit but does not. Would that the whole field could detect the fallacy of it as Fletcher did.

Conclusion. As far as I know, Fletcher's Study, for all-around excellence, excels any contribution on the subject of stammering which preceded it, either in this country or abroad.

GESTURE, MIMESIS, TYPES OF TEMPERAMENT, AND MOVIE PEDAGOGY

By G. Stanley Hall

These subjects have in recent years come into great prominence and are more or less connected. We have always realized that the unconscious had a form of expression more primitive and fundamental than language, and this interest has been greatly stimulated and developed by the movies, which have shown how almost every type of character, emotion, and incident can be dramatically presented without the aid of speech. The movie manager is particularly interested in physical types, and his success very largely depends upon his being able to find, as he is seeking to do in every walk and condition of life, individuals whose form and features are expressive. When superposed upon these gifts of nature he also finds a liveliness of disposition which readily expresses itself in attitude, postures, manual gestures, facial expressiveness, and flexibility of mood, he is most fortunate. The habitual use of speech as the medium of all kinds of communication has tended to make us forget this "language before language," and the cultivation of it has been neglected, not merely in preparation for the stage but in the field of general education. We are all betraying ourselves and revealing more than we mean or want to by our instinctive and automatic responses to impressions, and intuitive people always read in their own relations to other people far more than the latter intend to express. Speech tends, in this country perhaps more than anywhere else, to become monotonous and inexpressive of its emotional accompaniment, and the cultivation of the latter would not only greatly enrich social intercourse but would make directly for honesty. It is far harder to lie by saying No with every kind of intense negative expression of gesture, face, and vocal emphasis than merely to pronounce the word "no" in a dull unemphatic way.

The following thus is a plea for enriching social intercourse and the herd instinct generally by cultivating mobility of features, limbs, stresses and inflections, with a view to making life not only more expressive but more sincere and interesting. These arts have had wonderful forms of expression in the past but are now almost lost, and the life of gregarious man

has been seriously impoverished thereby. When movie actors are told, often at the most critical point of the story, to "register" fear, love, resignation, anger, etc., they have at present no recourse save only their own ingenuity, and the discerning spectator too often pronounces their effort sadly ineffective because their repertory of resources is so wretchedly poor, being limited to a very few and highly conventionalized forms. Of course genius always finds or makes a way, but genius is as rare in this field as in any other. How the discriminating spectator is thrilled, e. g., by a really new dance, with original features, which does not depend on or lapse to mere athleticism or acrobatics but shows a true artistic spirit and flash of originality! Still more is he stirred by expressions of grief which do not depend on sprayed-on tears and a face turned away or hidden because the actor is inadequate to do justice to the emotion, or to portray real psychic anguish. Here much, of course, lies beyond the present reach of any art that can be taught, but it is surely not too much to claim that every actor for the cinematoscope should be more or less familiar with and practised in the vast repertories of sign language in its broadest sense which have come down to us from the past. The following paper attempts to make a beginning, confessedly very feeble and inadequate, to supply this culture defect. We begin with gesture.

Gestures are movements addressed to the eye with the purpose of communication. They constitute sign language, and sematology is the systematic knowledge we have of them. They are written in the air and, despite many attempts, have had as yet no adequate notation; and until the kinetoscope they could not be recorded, for verbal descriptions of them are cumbersome, partial, and often ambiguous. Loss of the power to understand them, asemia, is almost as basal as apraxia, and involves more fundamental neuropsychic lesion than do the aphasias. They may be limited to the face or hand or even to parts of them, or may involve nearly all the voluntary muscles. Gestures have attained a high degree of development among the Indians of the United States because the population has been sparse. There were sixty-five radically different linguistic stocks unintelligible to each other, and intertribal must constantly supplement in-tribal communication. Hunting, too, favors silence and signs.[1] On the prairies and on the west coast, where languages are most diverse, the

[1] See the voluminous and copiously illustrated collection of these in Garrick Mallery's "Sign Language of the North American Indians." Annual Report of the Bureau of Ethnology, 1879-80, pp. 269-550.

Chinook jargon arose, as did pigeon English in China. Such mongrel species of language need to be supplemented by florid gesticulation. Among the Cistercian monks with their vow of silence a highly arbitrary and artificial system was evolved. Deaf mutes, too, not only tend to develop signs, but learn them so readily that those who insist on the articulation method, as do the Germans and most Americans—as opposed to the French scheme of developing natural signs, which enables them better to communicate with each other but less with normal people—find it very hard to repress this instinctive mode of conveying meaning.[2] Gestures are favored by secrecy, and the Sicilian vespers were said to have been planned without writing or vocalization. The subjects of Dionysius, the tyrant of ancient Syracuse, resorted to them when speech was forbidden. Operators in factories amidst the noise of machinery have become to some degree histrionic adepts. Lively feelings, a vivid imagination, and great vitality predispose to this primitive mode of utterance, and civilization is often said to reduce this ancient seasoning and coloration of speech.

Sittl[3] has shown in great detail how highly it was developed in classical antiquity as an integral part of religious and other festive dances, which were often very pantomimic, especially on the stage, with three gestural systems—cordax for comedy, emilia for tragedy, and sicinis for satire, partly because the audience was so large and masks precluded facial mimesis and modified vocalization. Canon de Jorio, in a great work[4] with many pictorial illustrations, has shown how in the Neapolitans the gestures of Ancient Rome not only survived but became still more developed as expressions of a vivacious diathesis which so predisposes to it that the rower drops his oar and the day laborer his tool to answer, and in the dark speech seems almost tame and bloodless. This he ascribes in part to an exceptional innate liveliness of temperament and objective modes of thought and life, aided by the momentum of both tradition and heredity. Austin[5] has shown how the orators of ancient and modern times made their art action, and many more recent rhetoricians have classified the position and move-

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[2] See J. Heidsiek: *Der Taubstumme und seine Sprache.* Breslau, 1889. 318 pp. See also Annals of Deaf Mutes. Washington, 1875, and Reports of the Hartford Institute for Deaf Mutes, where the natural signs were long used.

[3] Karl Sittl: *Die gebärden der Griechen und Römer.* Leipzig, Teubner, 1890. 386 pp.

[4] *La Mimica degli Antichi investigata nel gestire Napoletano.* Napoli, 1832. 380 p.

[5] Gilbert Austin: *Chironomia.* Cadell, London, 1806. 583 p.

ments of hands, arms, feet, legs, face, and the entire body, and would emphasize nearly every line of public address by graphic and vehement activities to enhance the effectiveness of their words. Many a writer from Engel to Pederit,[6] to say nothing of rhetorical and dramatic schools from Henischius to Delsarte, have striven to conserve or restore the old deep-seated instinct that vivid and intense sentiment of conviction of truth which the world desires and also the complete dramatical illusion of reality, which the theatre demands, could be both felt by the speaker and conveyed to others best by talking not with the tiny muscles involved in articulation, but with nearly all the possibilities of voluntary motion.

These are the influences that have favored the survival and development of gesture or prevented it from lapsing toward the position of a lost art; but they have also resulted in the addition of many artificial and conventional signs often very hard to distinguish from those which are most immediate and natural. Some gestures consist of tracing outlines or drawing in the air, and if recorded would be very like some of the pictographs of Egypt or the script of old Mexico, for some of their characters seem only written gesture. Gesture has some points of very vital contact with plastic art and with heraldry, and shades into primitive modes of dancing by imperceptible gradations. Some gestures are instinctive and universal among all people, and others, like e. g., the manual alphabet of the deaf mutes, are deliberate inventions. Gestures are often classified—by none more rigidly than by Wundt[7] who makes them to be referensive, imitative, co-designative, and symbolic, and even describes the very etymology and syntax of all such rubrics and categories, which while helpful to the novice in this field of study are inadequate and seem first artificial and then incumbrances as he proceeds. Social forms and ceremonies often involve gestures, and these tend to become stereotyped and then outgrown and thrown off by exuviation, like fashions. Instead of prostrating and kotowing, we bow, scrape and courtesy, then nod, then wave the hand without lifting it near the head; and instead of embracing and kissing, we touch finger tips. For Spencer,[8] gestures are motor discharges of the same kind but of less intensity than the movements which once satisfied or expressed the feeling that caused them. Out of a vast profusion the

[6] *La mimique et la physiognomonie.* Paris, Bailliére, 1888. 280 p.
[7] *Völkerpsychologie.* Engelmann, Leipzig, 1900, pp. 131-243.
[8] *The Principles of Psychology.* New York, Appleton, 1883, vol. 2, pt. 7, chap. 4.

fittest are slowly selected. For Darwin[9] they are survivals of movements once directly or indirectly useful, if not purposeful, the opposite movements expressing opposite feelings and intensity causing overflow into unaccustomed channels. Gratiolet and Piderit think gesture best explained by reference to imaginary objects of sense. They reproduce either faintly or in an exaggerated way what we should do if the object of experience was present. Hence their abundance and intensity are as that of our mental images. All these views are not only helpful but true, but each of them only of gestures of certain type, while others are left quite unexplained by all the theories hitherto proposed.

To understand gestures we must go far back of the conscious purpose of communication to the broad general principle that every psychic act or change is attended by a physical one. Not only are the emotions essentially motive, as the term implies, with concomitant vascular, cardiac, intestinal, metabolic, and secretive changes such as blushing, pallor, palpitation, relaxation of sphincters, tears, horripilation, nausea, and with modification of all the activities of the involuntary or nonstriated muscles, but thought and will also always play upon voluntary muscles, causing changes of tension and minimal as well as maximal movements. The superciliary and corrugator muscles have been called the muscles of thought, and their activity, gestures of intellection; and it is a familiar fact that planchette, ouija board, and so-called mind-reading is nothing but muscle-reading. Thought would probably be impossible with the most perfect brain if all the egresses were blocked. Efferent processes constantly play not only upon vocal organs but upon every part and process of the body, and every psychosis has or is its own somatosis.

Psychology is at least not yet able to demonstrate the existence of even a single sensation that is purely afferent and that leaves the emissive tracts unaffected, and animal life itself is predominantly if not essentially motile, i. e. expressive. From this broad basis a truly genetic doctrine of speech must take its departure. Pure feelings, thoughts, volitions, are abstractions, and even sensations are only stimuli, directives of outward currents; and sensory centers are only more intimate parts of the objective world, the essence of the soul being the apparatus or function of response which alone can give both reality and actuality to life, inner or outer. With the first animal, the first convulsive movement is also the very ipsissimal

[9] *The Expression of the Emotions in Man and Animals.* New York, Appleton, 1873, p. 340 et seq.

essence of the first sense of pain, and the same principle holds of every first feeling or sensation or of every new intensity of either. The first voluptuous experience was the first erection; the first cry was the first discomfort; and there was no content or inner side. The latter evolved slowly after repetitions had left their memory traces on the plastic nerve centers, which gradually acquired a degree of independence and later some power of initiative; and this, once a mere subjective accompaniment, still later transmits its effects by heredity, so that in the new-born the primal somatic origin of all feeling states is less pure. This view must not obscure the law that all interior states, however, arise primordially from somatic changes, and the brain, which is the unique organ of registration, can record nothing else than the results of bodily responses. The law that life is response is seen in all studies of instinct and habits of animals which are only organic memories, and even in plant physiology, as is shown by the experiments of Bose. Hence every movement in the animal world is, in a very generalized and fundamental sense, the matrix of its own psyche. Real, natural, and instinctive gestures arise out of activities from which they are at least one and may be many degrees removed, for some elements of reality are always wanting.

Greeting is of many kinds. Prostration, kotowing, salaaming, groveling, striking the earth with the forehead, offering the neck to be trodden on, kissing the ground—these are attenuated to courtesy with spreading and lifting the skirts, bowing profoundly, often in very elaborate ways, doffing the hat, once as a symbol of freedom, removing the shoes, washing the feet, with special toilets for meeting great personages, and finally the slight nod and wave of the hand toward but not touching the head. The embrace has declined to the hand clasp and shake or even touching the fingertips, where we have, too, the slang gesture of shaking one's own hand upon seeing an acquaintance and blowing a kiss. Detailed expressions of joy at meeting fine down to a faint flitting smile of recognition. These express all degrees of delight at meeting others from transports of rapture, frisking and capering, or highly artificial obeisances, down to mere recognition and then pass over into ignoring, cutting, and up the scale of hostile manifestations to personal conflict. There are gestures of abject servility that not only seem to place one's life in the hands of a superior but actually invite him to take it; but this was succeeded as the world advanced in democratic ideas of equality by an instinct to greet others precisely as cordially

as they do us. A part of what is called manners consists of gestures of salutation, and mediates instinctive likes and dislikes on the instant and courtesy and breeding have no better touchstone. "How much does the new acquaintance like and respect me and how much shall I show him any return" expresses the subdominant and ancient state of mind. From similar principles arose formulae of subjection in war—laying down arms, saluting the victor's flag, passing under the yoke, surrendering the sword, kissing the conqueror's feet, embracing his knees, etc. Close akin are many gestures of worship, which consist of voluntary self-humiliation before a divine potentate. Here again we have prostration, even with the face in the dust, bowing the head, kneeling, invoking mercy, various gestures of contrition, mourning in sackcloth and ashes, gestures of mortification and even self-mutilation, offering one's self up, etc. Many acts of worship are only gestures of reverence, adoration, and self-renunciation. Man slowly ceased to cringe and cower before the gods and learned to invoke them like the statue of the Greek youth in prayer, erect with open upturned face and arms extended in welcome and in petition.

Many other rites and gestures besides those for general communication express social and personal relations to our fellowmen. Negation is shaking of the head, and was very primitive. Thus the child turns from its mother's breasts or avoids proffered food. This gesture of refusal or dissent is very widespread, although some races, like the Arabs, toss the head up and back, clicking the tongue to signify breaking off. In all cases, the mouth is turned away as if the original *no* meant "I will not eat it." This gesture may be accompanied by turning away the whole body and manual gestures of rejection which make the act of declination more emphatic. Instead of talking face to face in harmony, recusants turn from each other to pursue their own way and will. *Yes* expressed by nodding is a good instance of a contrary meaning uttered by a contrary movement. The bow or assent was perhaps originally accepting food by inclining the head to grasp it with lips or jaws. Now it is accepting another's suggestion, and some think the nod is a relic of subordination, as of being second to the originator and propounder of the proposition and to that extent becoming his follower. So old and widely intelligible are these expressions that stiffneckedness means inability to bow in agreement or obedience, and I have heard a stubborn man described as prone to shake his head vigorously when alone, but meekness is typified by the head always

lowered. There are many gestures of invitation; beckoning with the finger with palm uppermost or with the hand, with one or both palms, holding the hands out,—all of which mean *come*. But its opposite, repulsion, has far more forms and shades of meaning. Rejection is waving away or pushing off. There is also an upward or forward movement of ejection or throwing out, and this may be emphasized by many more explicit gestures, even striking and butting and simulated forms of attack, shaking both fists, nodding obliquely in threat, defiance with raised chin and perhaps the back of the fingers bent at the knuckles beneath it, and contempt snaps and even twiddles fingers; while the famous *mano cornata* (the index and middle finger extended horizontally toward a person or object with the thumb and other fingers folded) Jorio says has in Southern Italy at least twenty distinct meanings, such as avaunt, stop, cease, drop it, warding off an evil eye, breaking a charm, spell, or hoodoo, etc.

Pointing and *looking* designate any object real or imaginary in any direction and at almost any distance, and so does drawing its outline in the air. More commonly, however, some attribute is selected and imitatively suggested. Rain, e. g., is depicted by both hands held high, with wrists and fingers limp and hanging down; water, by undulatory movements with the open hand, palm downward; smoke, by twirling the forefinger upward as smoke curls; a stone, by lifting and throwing movements and perhaps pointing to or touching the teeth to indicate its hardness; a blaze, candle, or torch, by blowing one the erect forefinger; a tent, a wigwam, by crossing two or more fingers; a tree, by holding the hand up with fingers apart like branches; grass, by some movement with the hand held low, and growth by rythmical pulsing movements upward; a bird, by pecking with thumb and finger together like a bill; a goat, by stroking an imaginary beard; an ass, by wagging the hands each side of the head like ears or with two hands together open with thumbs for ears and mouth open by drawing down the apposed little fingers, as very many creatures and objects can be represented by handmade shadowgraphs, in the production of which variety stage experts sometimes attain great proficiency (as was and still is seen in the shadow-play theatres of Europe, as Miss Curtis has described them); an ox or cuckold, by a gesture of horns; a ram, by that of butting; a horse or riding, by two fingers of one hand astride the vertical open palm of the other; a bear, by imitating its paw with the hand; a white man, by drawing the outline of a stove-pipe hat in the air (Indian) or taking

it off (deaf mute); a woman, by drawing the finger across the forehead to indicate her shorter or cut off stature or drawing it down the side of the face under the chin to suggest bonnet strings; a baby, by dandling the other elbow; the speechlessness of an infant and the toothlessness of an old person, by the finger laid across the mouth horizontally or pressed into it; the sun, by making a round circle with the thumb and forefinger of both hands; money, by a smaller circle with one—all these are samples of standard gestures indicating objects. Colors may be designated by pointing at the lips for red, teeth for white, sky for blue, trees and grass for green.

Another group of gestures signify *mental processes,* such as the effort to remember indicated by tapping the forehead; forgetfulness by scowling, turning the head, shaking the hand before the face or striking the forehead; to think by bowing the head, shading the eyes with the hand; mental by the act of manual prehension, and apperception or knowing that we know by clasping one closed hand with the other; wisdom or thinking by laying the forefinger on or beside the nose, and conversely folly is sometimes indicated by placing the little finger there; lightness, by laying the two forefingers together; silence or attend, by holding up the forefinger and fixating or laying the forefinger vertically upon the lips; surprise and incredulity by elevating the brows, protruding the lips, and sucking in the breath audibly; none or nothing, by throwing both hands out; number, by counting the fingers; many or accumulation, by clawing or grasping together with both hands.

Very many *moral* acts and qualities can be designated by gesture, such as lying by thrusting the curved forefinger obliquely from the mouth for "speaking crooked;" a truth, by a straight out movement; lying is also designated by the two little fingers hooked and the other crooked and sprinted apart; badness and rejection, by throwing a closed hand down, out, and opening the fingers; contempt or indifference, by snapping the fingers; theft by the hand half shut, fingers apart about to grasp furtively; miserliness by rubbing the thumb and forefinger; coquettishness by placing the forefinger against the head inclined to the side; justice by holding scales; conscious beauty by the thumb and finger each side the outer corners of the mouth and looking pretty; ugliness, the same with face awry; friendship by locking the two forefingers or all the fingers; strength, by clenching the fist and clutching the biceps and perhaps a violent downward throwing movement; too bad or mild reproach, by placing the upper

teeth over the lower lip perhaps after a dental lingual smack; don't know or care, by a shrug as if to throw the matter off one's shoulders; conscious pride, by a swaggering gait with arms akimbo in a woman, or hands in the pockets or behind the back in a man; drunkenness, with reeling and perhaps hiccoughing after a drinking gesture; despicableness by sneering and turning up the nose. Indecent gestures are legion in number. Perhaps in this category also belong much of the motivation which impels children to make faces at others.

One class of gestures are vulgar and analagous to slang. Such are those of kicking one's self for remorse or regret; incredulity by pulling at the collar or neckgear suggesting something too big to swallow, by pulling down the lower eyelid to suggest that the eyes are open or that there is nothing green there; craziness by whirling the open finger or even the hand about the head suggesting wheels; intrusive confidence by winking with one eye; trying to laugh at a poor joke by tickling one's self; effort by wiping the forehead with the hand or thumb with a motion of flipping gouts of sweat upon the ground; decapitation by drawing the finger across the throat with a gutteral k-h of spurting blood. Perhaps here too belong touching one's own head, shaking it and pointing to another to suggest daftness, and yawning by opening the flattened hands at the wrist, which sometimes causes it in others by suggestion.

Mien, mimesis, gesture and pantomime can together express every one of the feelings and emotions more graphically and forcibly than words can do. Roscius might well have won over Cicero in the reputed contest who could express a content in most ways, if that content were in the sphere of sentiment. Strictly speaking, the inflections and stress that accompany speech are emotive gestures that enforce and illustrate the meaning of words; and vocalization, out of which language sprang, was itself first merely almost an incidental and accidental accompaniment of gesture. Emotional gestures, it is said, are less differentiated than intellectual ones, but this is because feeling is itself a more generalized form of mentation, and the same also is true of the terms used for feelings, which are very inadequate and not sharply discriminated. Without gesture in the largest sense, we should know little or nothing about the feelings, and in its impending work of penetrating the field of emotional life, psychology will find one of its new highways to this goal, when opened up, to lie through the interpretation of natural gestures.

When we turn to the *volitional* life, we find again that

gestures can be more contentful than words and can reproduce nearly every typical act and occupation of the human life with great fidelity to copy and with little miscarriage in communication. Such holophrastic motor talk is, to be sure, vastly harder than merely oral speech, the economy or laziness of which tends to depletion of content. Dramatic reproduction may be very hard work. Our muscles are not taut enough to talk with the eloquence of action of our paleolithic forbears, and so our mode of expression is attentuated and mentation is "sicklied o'er with the pale cast of thought" till its reality often seems wan and spectral. In recounting to others and perhaps even in recalling to themselves, men were once redoers of deeds. They did not hawk, trill, whisper, sibilate to the secret ear, which they could do in darkness, but reënacted all to the eye in the open light of day. They used no merely lingual or dactylic tongue, but their ideographs were formed more with the fundamental than the accessory muscles. This mode of communication has nothing esoteric, is not limited to a single tribe or circle that knows but one tongue, and so needs no hermeneutics, but would be intelligible to the polyglot world, for there is no divorce between words and things, no nominalism but only dynamic realism in thought and life. No form of converse is so *anschaulich,* so compelling of attention and sympathy, and withal so exhilarating to both orator and audience; and for this reason this pristine mode of imparting mental states passed naturally and inevitably into the primitive dances which set forth in idealistic form not only every emotion, with profuse stage setting, but every typical phase of human activity—domestic, social, vocational, religious, and all the rest; and these have been invested with such charm that they have very often survived the last vestige of their original meaning.

One class of gestures is immediately connected with the *senses,* each of which has its own group. For the tactile sense, there is stroking, patting, and the comic gesture of touching with the finger tip indicating touchiness, mimetic tickling, etc. A bad smell is indicated by constricting the nostrils or holding the breath, perhaps pointing to the sources of the bad odor, a common form of insult among children. A sneer is in part evolved from this latter indication of malodorousness and of repulsive flavors, while agreeable perfume or olfactory testing is expressed by sniffing. Good taste is indicated by smacking the lips; and bad, by opening the mouth, protruding the tongue and drawing up the lips, perhaps with incipient gagging and the mimesis of nausea, perhaps of

vomiting. Hunger is expressed by hollow cheeks and pointing to the slightly opened mouth; and eating and drinking may be elaborately mimicked, satiety being indicated by rubbing or patting the stomach, and starvation by pressing it in. Closing the ears with the fingers suggests loud or disagreeable sounds; and holding the hand to the ear means a faint sound, listen or speak louder, as indeed does even turning the head or leaning forward to bring the preferred ear nearer the source of acoustic stimulation. Scowling and fixating, real or imaginary, by shading the eyes with the hand, holding up one hand to each eye as if the former were the tubes of an opera glass, casting down the eyes in shame or modesty; rolling them upward in prayer; closing them with perhaps nodding the head or resting it inclined on one side upon the hand for sleep; turning up the eyes showing the whites below the iris for death; looking down and obliquely with elevated and inclined head for despicableness or looking down upon; fierce corrugation of the brows in anger; opening them widely in surprise and fright; fixating afar with eyes wide open as a sign of abstraction, dreamy revery; blinking, rubbing the eyes for sleepiness; wildly rolling them for shock and confusion, etc.;—these indicate the wide range of expressiveness of which the lids and brow are capable—the eyeball itself, the center of all these changes, remaining perhaps unchanged. This class of gestures begins in infancy with taste, and later with sight responses, and evolves from these foci in mouth and eye. Well on in childhood at an age extremely variable with individuals, these spontaneous reactions may become voluntary, and at about the same time they can be repressed. When consciousness can thus control them, they may be simulated toward imaginary stimuli; that is, sense gestures are susceptible of a high degree of evolution and may thus come to express perhaps as great a variety of impressional, moral, and intellectual reactions to the world as all that large class of words themselves which etymology shows once expressed pure sense action and later became symbols or metaphors of highest qualities and activities. We speak of good or bad taste in dress or art, bitter experience, sweet memories, a clean heart, a dirty act, a foul deed, a white life, a bright example. We hear the voice of conscience, see truth which is the light of the world, etc. Indeed, science has been defined as reducing the world and life to expression in the simplest terms of real or possible sense experience.

If this be so, it follows that just in proportion as we think clearly and resolve the world of man to its simplest, easiest,

and most basal terms, we tend to restore, at least in faint degree, the primitive facial mimesis which attends the activity of the different senses. This is to make thinking natural as well as economic. In proportion as we think in mental images, we play upon their complex efferent apparatus, and it is this which gives content and reality to our mental processes and tends to prevent them from becoming merely formal or verbal. Hence it makes for honesty and truth. In the faces of deaf mutes, these intense facial reactions are sometimes highly developed and are important factors in communication, while the blind not only preserve the facial expression of infancy connected with the lower senses, but their psychic processes are reflected in movements about the eyes. These mimetic reflexes in their faces, although most developed about the lower senses, make their thought more palpable and literally add a peculiar natural force and eloquence to the higher and most abstract thought processes. The play of these sense factors in speech and thought gives a visual and emotive accompaniment and reinforcement, as if these senses were themselves acting upon the mental content and thus making thought process less remote and abstract in a way that convention represses all too soon in the children of civilization, among whom conversation grows verbal and desiccated, because divorced from the rich life of sense and feeling out of which the intellect arose. The conservation and development of this element gives pristine vitality and force to diction; freshness, wholesomeness and even sanity to thought; approximates it to action and feeling; makes it lively with pictorial and dramatic content and prevents it from aridity, which for the average man and woman is the death of zest and the shabblonization of experience.

Facial movements and gestures reflect and express every emotion, every shade of pain from acute physical to moral suffering, and of pleasure from that of sense to religious transport. Thus these all are uttered and understood by intimate acquaintances without words. Although these algedonic states can both be simulated and dissimulated, the range of control is limited in their stronger spontaneous expressions, which may affect every muscle, voluntary and involuntary, and modify every physiological and metabolic process. This all-pervading somatic resonance of itself suggests that this is the oldest and most basal of psychic experiences. Pain, of course, shows, very many shades and grades, even in early infancy, when it culminated in the full almost convulsive cry with abandon, which at its height is perhaps relatively to the total

motive energy the most intense degree of exercise the human individual ever puts forth, extending to every organic function. Laughing begins much later in an awkward way, and is at first far less emphatic and even in riper years is far more under the control of the will. In its intenser forms, its facial and general motor effects more closely resemble those of crying with tears. Both may cause local aches, and when beyond control each may pass into the other, as is seen in hysteria. This, however, is only when and because their degree is convulsive. Within normal limits, the two are essentially distinguished and contrasted in their physical expression and in their subjective state. In infancy, however, the feeling is the expression, and there is no causal or temporal sequence between the two, but only the relation of identity. Even the slighter shades of sadness and happiness consist in the reproduction of the physiological processes which in our ancestry, human and prehuman, were depressive or exhilarating, i. e., repressed or augmented life. The evolutionary formula for violent crying is pain and devitalization seeking relief by learning, as animal life can do, to draw upon kinetic reserves. There is no psychic state save the feeling of the act of crying, its kind and its intensity. The movements themselves are the felted ontogenetic traces or rudiments of all the efforts the phylum has made to escape or resist pain, and these movements bring with them more or less of the ancestral pain, for motor cells and contracting tissue are the bearers of such hereditary functions.

Deaf mutes naturally become adepts in the use of this mother tongue of the race, and their gestures and those of savages are only dialects of the same primeval language. Both are surprisingly quick to catch salient points of strangers and new objects, such as glasses, long hair, mustache, fire arms, keys, tools, and things are sometimes described at first with very elaborate gesticulation, air drawing, etc., and when once understood a single characteristic movement or posture is selected from a complex whole and suffices.[10] Many spontaneous gestures may fairly be called universal, but upon them are now superposed more or less arbitrary symbols, such as touching a part of the hand or the body for each letter; then dactylology and last of all, articulation taught at first by manipulating the mouth. These latter tend to repress gesture, which is indeed often forbidden somewhat as the speech of adults still earlier

[10] Hartmann: *Taubstummheit und Taubstummenbildung,* Stuttgart, 1880, 212 p., chap. 12 on Gestures. See also J. H. Keep: *Sign Language in Deaf Mute Education. New England,* Vol. 26, p. 506.

in life checks the spontaneous evolution of speech in normal infants. By these movements, the language of the deaf loses its generic fundamental character and becomes specific, alphabetic, and even phonic, and thus much is lost and much gained. It is an inestimable advantage to speak, and parents prefer this method because it rescues their children from isolation and tends to make both almost forget the infirmity. Yet most deaf mute children, when they first come to an institution where instruction is given, have already learned many gestures of much grace and even beauty. To penalize them for using these condemns the child to solitude during all those gregarious years required to learn articulation. Moreover, their voices are always hard and disagreeable, and the children soon come to know it and hence often dislike to speak and perhaps cease to do so after leaving school. Training in speech is very hard for the voice and there is often great pain, while its quality deteriorates, for the speech is not natural but is like walking with a partially atrophied leg. The use of signs to translate the meaning of words makes phonic instruction more rapid and contentful, and shows what is and is not understood. Signs are so full, however, of power and life that they do strongly tend to encroach upon more artificial and later methods. Slovenly modes of speech like the Yankee dialect are easier for deaf mutes, as indeed they are for others, than is correctly spoken English, and clergymen who drop the use of manuscript and preach more naturally without notes often recover by so doing from clerical sore throat. But speech for deaf mutes magnifies these difficulties for it is far harder than good English for the normal person, or unanimated reading for the clergyman. It is, therefore, as cruel to forbid signs as it would be to forbid English on the street to beginners in Latin. It is also unpedagogic, for signs give vitality to speech that nothing else can supply. Hence, signs, finger language and speech should be combined.

We are told that in 190 A. D. the 6,000 *pantomimists* in Rome were retained in the city in a famine when strangers and philosophers were banished, so highly were these dumb actors prized. They were interpreters with people of unknown tongue and attended armies on their conquests, and there were at least two schools—one dignified and serious and the other sportive and often indecent; and so expert were they that the lives of great men were told by signs. Probably only deaf mutes under favorable conditions can nearly approach this perfection, or could in the days when Abbe Lambert published his dictionary of signs, but these had been repressed in the

interests of articulation and lip reading. Many of the simplest of these are tropes, especially metaphors which called the hero a lion; or metonomy which puts, e. g., the sword for war, the concrete for the abstract; or synecdoche, which puts the roof for the house, the beard for the man, etc. Height is expressed by raising the hand or looking up; depth by the reverse; intelligence by tapping the forehead and looking wise; deafness by stopping the ears; blindness by laying the finger on the closed eye; the future by a wave of the hand in front and past time by a backward movement; long, by drawing out as if a string from the other hand; stiffness by rigidity of body; dreams by a sleeping gesture and moving the fingers wildly before the closed eyes; a mirror is indicated by standing before it and making a toilet; a chair by the gesture of sitting in it; sand by letting it sift through the fingers; a fly by a movement of catching it; boots by putting them on; lightning by zigzag with the finger; old age by its posture and gait; thunder by collapse of flexed joints; Jesus by pointing to imaginary wounds in hands and feet; a doctor by feeling the pulse; etc. Most such signs are ideographic movements which hearing persons understand much more readily than they do the sometimes painfully artificial, hollow, cachophonous words which the German method produces and which represses such signs as Hearne[11] well says are "inhuman." They are quite as designative as onomatopoesis is for sounds in nature, and indeed are compared with it.

Compound signs follow the same rubrics of origin, mode of use, form, effect for cause, and vice versa, general indication with specific marks, etc. For rich and poor there is first the sign for man and then the specific sign of the condition or the kind of man may be further designated, as little, dark, crooked, hungry, etc. To state that he is a father, the elbow is thrust forward from the right side as a sign of generation, with the reverse movement for mother. A boy is a man plus the sign for short stature, and for a girl, the sign of a head-dress or long hair is added; assassin is indicated by the sign of stabbing with the thumb; a goose is a bird with a bill sign made with thumb and finger; a red rose is flower plus the act of smelling and perhaps thorns and touching the lips for red; snow is white, falling obliquely or of snow-balling; boat is tracing its form plus the act of rowing; a calf is a quadruped with the sign for little and the gesture of sucking; a cater-

[11] See his admirable articles describing many of these natural signs in the American Annals for the Deaf beginning April, 1875, vol. 20, p. 73, and continued in four articles.

pillar is a worm with pointing to the hair and the gesture of gnawing leaves; a table cloth is the act of spreading or smoothing it; a bee is designated by the mimesis of stinging and of the hand swelling; a dog is indicated by patting the knee and imitation of its bark; hare is long ears, shooting and eating it with pleasure; apron, cravat, stocking, glove, by the act of putting them on; pump, swing, door, cradle, watch, etc., by the act of using them.

The sign language knows neither noun, verb, article nor pronoun, and its syntax is radically different from that of oral speech, but the deaf mute can represent the temporal sequence and in that he has the advantage of the artist. He can also abstract, localize, and accomplishes much by assignment. He deals with roots and is greatly helped by trained teachers who are also deaf mutes. Complex signs admit of and soon attain great development. Methodic and artificial signs are diverse somewhat like, though less than, dialects or even languages sprung from one parent stem, and yet most diverse signs for the same object are easily understood by those accustomed to others. As accompaniments of words they have great explanatory power for normal persons, but are far more helpful in aiding the intelligibility of the somewhat ghastly vocalization of even the most expert articulators among the deaf. The teacher always has very much to learn from the pupil. The fact that many of the de l'Epee signs are highly artificial should not prejudice the cause of natural signs.

Being strongly motor-minded, I selected and listed 100 serial motor operations with which I am more or less familiar, such as eating a piece of meat; opening, pouring and sipping a glass of apollinaris; opening and using a napkin; sawing a stick of wood; shuffling and dealing cards; counting bills; sharpening a razor and shaving; striking a match and smoking; dressing and undressing; playing billiards; throwing and catching a ball; writing; taking down, opening, and reading a book; loading and shooting; playing various instruments; rowing; tennis; bowling; shopping; hoeing; washing; wringing; driving a nail; peeling an apple; folding and sealing a letter; making a fire; prying out a stone; spinning and weaving; husking corn; chopping, shovelling, etc.,—all requiring manipulation, and practiced the movements involved in each process, but only with imaginary objects or implements. At the outset, those before whom I exhibited interpreted my dumb show correctly in every case and usually with a promptness that surprised me. I was still more astonished, however,

to find how clumsy, incorrect, and often halting were my efforts. Where it was convenient to do so, I practiced alternating with real objects or tools and then without them in pantomime and found that while I could thus add many details and greatly increase the fidelity of my mimicry, the latter was still very inaccurate in particulars and often most so in those most habitual and automatic. By persistent practice, some of these motor compositions grew quite elaborate, and the vocabulary of movement items multiplied and I almost seemed to be handling the real things. It was often difficult to avoid exaggeration; facial and sometimes interjectional accompaniments were hard to repress despite the unreality of it all. It was a vivid language, and the gymnastics of these performances afforded such a variety of exercises that they seemed to open suggestions for a new hygiene of body and mind. Such active work with the old labor canticles that once accompanied some of them, a few of which are now being restored, when set to appropriate songs, as is now sometimes done, in the movement games of the kindergarten, is now receiving much attention, as it did two or three centuries ago in training for the stage dancing and pantomime as well as dramatic schools. This work is highly conducive to unity and harmony of body and soul. There are here both psychological and pedagogical possibilities that should be explored. Such imitative activities, if rightly environed and sanely used in the curriculum of motor education, cannot fail to tend to idealize labor in the minds of children, and they afford just those rudiments of primitive and even modern industries and occupations as are fitted in the order of growth to give betimes insight into and sympathy with these aspects of both toil and play, for both are at the same time recapitulatory and preparatory for a large domain of human life. They give a most wholesome stimulus to the imagination and also quicken observation. Such abridged, poetised versions of characteristic human activities have underlain most of the many popular festivals of mediaeval Europe, in which the processes of physical toil were at the same time made into play and dance and elevated to symbols of man's lordship over nature, while some of them become almost sacraments by association with myths, festive rites and pageants.

Pantomime. Our spontaneous movements of body, limbs and features by their kind, energy or languor, their extent, rapidity, frequency, etc., often reveal to friends our inner states and enable them to read our minds through our muscles, despite our efforts at control and our conviction that our

words have concealed or diverted. These, like our very inflections, may mediate instant and persistent likes or dislikes in strangers. These automatisms often suggest character, disposition, and even biography, and by these means affection and fear as well as sympathy, curiosity, or other interests penetrate as by divination and their motor expressions unconsciously uttered are unconsciously understood. Acute observation and practice brings great proficiency here. When expression as an art enters this field, we may learn to command some of these resources at will, but the highest art, while it may exaggerate and improve on nature in certain directions, always remains far behind her in all-sided range and scope, as well as in subtlety and delicacy.

Mimesis, even if mechanically obtained, not only suggests but reinforces emotion. Duchenne stimulated facial muscles of expression directly in an individual insensible to pain, and could produce striking expressions of it on the face; and Dumas,[12] by stimulating the facial nerve at a certain point before its ramification, could produce as definite and complex an expression as a smile. Stimulating still higher up, viz., in the bulb, Meynert found reflex centers of the viscera and circulation. Bechterew,[13] after destroying the higher centers and thus eliminating intellectual activity, found that by stimulating the thalamus, animals bristled, bared the teeth, and showed other strong expressions of anger and fear, while caresses caused cats to purr, dogs to wag the tail, etc. Thus, without conscious intelligence, both peripheral and central excitement caused pronounced emotional manifestations, although the latter were never spontaneous. So, in man, Huguenin and Magnus have shown that where hemiplegia had broken the connection between the cortex and the bulb, so that involuntary movements were impossible, the pure, automatic mimesis remained, provided only that the thalamus was intact. Conversely, Bell and Stromeyer showed that if the cortex is intact and the thalamus destroyed, automatic mimesis is abolished in both animals and men, while the power to voluntarily perform these movements remains. The excitation of the thalamus and globus palidus tenses up the blood vessels and increases pressure. Stimulus of the middle part of the thalamus augments that of the external part, and reduces intestinal action; that of the frontal part causes defecation; that of the inner, lower region near the gray commissure makes tears secrete; that of the lower part of the anterior nucleus

[12] Series of articles in the Rev. Philos., 1905.
[13] Les Voies de Conduction, etc. Paris, 1900. p. 860.

contracts the vessels; and that of the gray commissure dilates the pupils. Bechterew also described cases of involuntary laughing and crying in cerebral troubles. He doubts the existence of any psychic element in these cases, but is inclined to regard all subcortical activities as purely automatic.

Rudolph,[14] taking his departure from facial expression, finds six primitive forms of psychic excitation; viz., fear, concentrated energy, repulsion and disgust, impulse to bite, eat and get, joy, malevolence and hate. Beneath these lies only the principle of opposition, i. e., attraction toward the pleasant and aversion from the painful. From these he derives all the 907 species and varieties of emotional expression depicted in his cuts, all presumably of his own very plastic face. This involves a very complex scheme of emotions which the author makes little attempt to justify or explain in detail. Indeed, it is impossible to evoke emotions of a very pure or strong kind at will and very many, if not most, of these grimaces are so conscious and arbitrary that they are not readily intelligible and the significance given them by different writers would differ greatly. Even if the feelings were evokable by an experienced and skillful actor or pantomimist, no face is plastic enough to express them all and each cast of countenance as well as each type of psychic disposition predisposes to excellence in some and efficiency in other forms of expression. This writer's face, e. g., is heavy and serious and his efforts at hilarity in all its forms are but little contagious and are hence lacking in interpretative efficiency. The face of these cuts is somewhat too old and rigid and not a few of the expressions are not pronounced enough. This defect is obtrusive, despite the fact that most of the physiognomies have been much retouched and given accessories in the way of modifications of the hair, beard, dress and interpretative hand gestures. Conventionalities, such as the influence of certain well-known crucifixion faces, the Laocoon, etc., are manifest. In 36 general classes of expression are included facial gestures of each sense in action and in defect, as well as blowing, yawning, sneezing, etc. The Lange-James theory that the feeling is the physical expression may encourage writers of this kidney to make faces and then put a name to the feelings they think they express, but aside from a dozen or so fundamental emotions, such interpretations are as diverse as are the attempts to describe the sentiments and imagery of musical phrases. I have shown these and other similar cuts to children

[14] *Der Ausdruck der Gemütsbewegungen des Menschen.* Kühtmann, Dresden, 1903. 2 v.

of various ages and find that lively girls in the early teens very quickly and readily reproduce almost every facial expression and some are extremely clever in describing, often in very original phrases, the psychic states represented. Whether they are innately less expert in making faces than boys or merely more reluctant to distort their features, they certainly see more meaning in facial expression thus depicted than do boys. Yet the faces of girls unconsciously or instinctively reflect finer shades of emotion than do those of boys. In all such depictures the potent defects of movement and of changes of color are of course eliminated. This author refers to no authorities whatever save Darwin and does not discuss the perhaps most practicable of all questions in his field, viz., whether facial contortions of the kind he commends increase or reduce plasticity of the countenance in its unconscious play. We believe it can no longer be doubted that most faces are less expressive than they could be, and that some such mimetic gymnastics should betimes be a part of the aesthetic education of all, not only to prevent rigidity of features but to widen the gamut of emotional life. Experiments in having children and youth make faces in imitation of a well chosen series of cuts and then describe what they express are greatly needed. The old admonition against face making should thus give place to exercises of this faculty and these will no doubt soon be curriculized.

Hughes' work[15] is the most belabored of all the recent books upon the subject and shows wide reading and much thought. It is written from the standpoint of a voluntaristic psychology, for he says ours is an age of will and deeds. He strives to be in a sense genetic and his interest centers about the question how natural instinctive movements are transformed into symbolic expressions. He makes four chief kinds of emotional feeling: viz. (1) mood (Stimmung) including jollity, joy, complacency, abandon, bad humor, ugliness, despair; (2) attention, ranging from liveliness and energy to wildness, rage, relaxation, exhaustion and unconsciousness; (3) inclination, from love and benevolence to aversion and hate; and (4) respect, from reverence and honesty to modesty, shame, fear and contempt and he makes much use of opposition, laying off feelings along a plus and minus line each side of an indifferent point, those of desire its highest positive form of striving toward shades through inclination to indifference, then rises negatively through aversion to resistance, the latter representing the negative pole of displeasure and the first the

[15] *Die Mimik des Menschen.* Alt. Frankfurt a. M., 1900. 423 p.

positive one of pleasure. So the rapture of enjoyment shades down through rest, which is neutral, to pain, the highest evaluation through indifference to contempt, genuineness into falsity. Many of his characterizations are graphic, but there is the tendency that besets most literature upon this subject to overnormalization, the analyses are too refined and the rubrics more or less speculative and systematization is overdone. Although his work is chiefly devoted to conscious and purposive gesture, the phenomena of natural expressions are the key to nearly all his problems so that in passing these over so lightly, one's verdict upon the validity of his conclusions often hovers in the air. The style is often prolix and even tedious. The author professes to be genetic, but his interpretation of this word will prove misleading to all interested in evolutionary origins. Hence the work is not sufficiently concrete or empirical, but hovers somewhat in the air. The descriptions are often excellent, such as those of desire, uncertainty, searching, triumph, the food quest, jollity, sycophancy, etc.

The most elaborate and systematic work on the basis of Del Sarte who published nothing, is that of Giraudet[16] who would have people dance and sing with the same freedom with which they walk and speak respectively and who pleads for a new aesthetism as an "emanation of the soul." He lays less stress upon the Del Sartian symbolic philosophy than did Abbé Delaumosne[17] and is more practical than Arnaud.[18] Life is action and this is expressed in man in 729 kinds of dynamic phenomena grouped in a trinitary way and all classified as either constitutional, habitual or fugitive. His cuts of passional attitudes and expressions of eyebrows, nose, mouth, head postures, shoulders, arms and hands, trunk, legs and feet are mostly characteristic and distinctive and have contributed much to revive Del Sartian studies for the stage in France where they had sadly declined.

Will interferes with the purest manifestation of expressive gesture, says Kohnstamm,[19] which is at bottom involuntary utterance of feeling. As its purest indicator, such expressive moments have immense importance as revealers of associations of our entire psycho-physic apparatus. They are the physio-

[16] Mimique. Physionomie et Gestes. Paris, 1895. 128 p.
[17] The Art of Oratory. Tr. by F. A. Shaw, Albany, 1882, pp. 172.
[18] F. Del Sarte: Ses découvertes en esthétique, sa science, sa méthode, précédé de détails de sa vie. 1882.
[19] Die biologische Sonderstellung der Ausdrucksbewegungen. In Jour. f. Psychologie und Neurologie. 1906. Band VII, pp. 205-222.

logical equivalents of the feelings and begin perhaps among the very first expressions of life. The telokinetic end is a relief. Their purposefulness is great, but without consciousness. One principle underlies the visceral or smooth and also the voluntary or striate muscles. As anger checks sensations of the secretions of the fluids of the stomach, so hypnotism may influence menstruation and possibly ovulation.

Albert Borée[20] makes a valuable contribution to the material for a theory of physiognomy. He has for many years been connected with the theatre and attempts here to assume for the benefit of actors and painters and sculptors ten groups of facial expression for the various sentiments. It is indeed a brief dictionary of the characteristic expressions of the various emotions. All are photographed from a single face and in all there are 119 of them.

Bechterew's article (La Role biologique de la Mimique, *Jour. de Psy.*, 1910, 385-408), contends that all mimetic reactions are of essentially the same nature as reflexes, though they are much more complex. Associations may also be formed between new excitants and old reactions. When we weep at bad news or smile ironically, it is because associations have been formed between the news and painful sensations, or because it calls up the lost friend. But in these last cases the act is also reflex, since it is as difficult to repress the tears or smiles as to repress the cry of fear or the laugh from tickling. The origin, however, is indirect, due to association of the news with sthenic or asthenic sensations and the response he calls an associative reflex.

Gestures are a higher stage of voluntary and reflex movement.

Human mimicry has its origin deep down in the animal world, as many biologists, but notably Darwin, have shown, but the expression is always more or less modified by the necessities of the bodily form of the species. They rise not from their utility, but from necessity.

Mimetic movements fall then into two classes—reflex and associative. Each of these has subdivisions according to the sensorial origin of the reaction. Thus under reflex there is organic mimicry from general coenesthesia, including hunger, satiety, well and ill being, suffocation, and so on; muscular mimicry expressing vigor, fatigue, defence and attack, etc.; sex, expressing desire, disgust, shame and innocence; visual and auditory mimicry expressing nervous concentration; in

[20] Etudes physiognomiques. Les expressions de la figure humaine. Lawrens, Paris. 30 p.

associative mimicry the movements are of the same nature but responses to indirect impulses. Cold causes trembling but so may fear. Joy dilates the peripheral vessels, but so may a caress. The comic causes a laugh but so does tickling.

Gestures come from the associative activity of the nervous system still farther removed, and are in part reflex and in part voluntary, and beside them may be placed descriptive, associative and symbolic movements. Pantomime is the best case of descriptive movements; the movement of the lips in cutting with scissors illustrates the second; language is the most highly developed form of the third.

Now Bechterew's contention throughout is that naturalists in describing all these mimetic reactions, even Darwin, have tended to refer them to subjective states akin to our own, whereas they come of necessity from the reflex reactions to stimuli or the associative activity of the nervous system, which he seems to consider also reflex. For instance, many animals in attack swell the body or certain appendages, or the hair rises, etc., and this has been interpreted as being done to terrify the enemy. But in the first place, most combats occur between males for the female, all of one species, and it is not reasonable that such familiar phenomena should rouse terror, nor is there any evidence that they do. Size does not alone cause terror, or dogs would not chase horses and cows. In cocks, moreover, although the neck feathers rise, the wings and body feathers and tail all flatten, making the body seem smaller. The true explanation is that these are means of defense of the neck or other exposed parts. Similarly, the various supposed ornaments, the love song, etc., related to the sex instinct, are the reflex results of sex excitation and not due to any desire to show off. They do indeed rouse the female by their stimulation, but they are reflexes in the male.

Thus one might work out in detail the development of every mimetic movement from the standpoint of reflex action and utility to the species, without ever so much as referring to desire or volition on the part of the individual.

Somatic Types. Back of all expressive movements lies the language of congenital form of feature, face, skull, contour of the whole body; and this is the basis of beauty or ugliness which heredity gives and which therefore lies yet more beyond control. All these and even the human form itself are eloquent of still profounder strata of possible meanings, could we but understand their language. Every trait and peculiarity of every part and organ has its own cause or sufficient reason in the story of the phylum. Thus every animal form expresses

all of its history that has not been superseded or repressed to imperceptible rudiments. The deep sense of this draws and charms, yet baffles and eludes us. Perhaps the future may never learn to read all the hieroglyphics of morphology. The strength of the profound attraction toward this realm is shown by many absurd pseudo-systems—phrenology, characterological schemes of interpreting eyes, brow, nose, chin, lips, ears, into which some have attempted to read as many meanings as a lover sees in these features of his mistress, palmistry, and even in the old sympathies once traced between the parts of the body and plants and planets by medicine and astrology respectively. So fecund is fancy in this field where science can only grope that some diviners have flourished on the blind popular lust for metanoetic self-knowledge, and these interpret every lineament of the countenance, every joint and line of hand and fingers as thickly set with manifold significance.[21] But little less fanciful are works like Schach[22] and Redfield[23] who see many suggestive traits of animals in human faces. These analogies are copiously illustrated by ingenious parallelisms between portraits or even historical personages and lions, oxen, pigs, apes, and even birds and reptiles. These likenesses are sometimes obvious and even suggestive, but are greatly heightened by art, and are in fact based less upon physical resemblances than upon analogous qualities which speech has always acknowledged in many a trope, and symbol and literature in many an animal myth. But that the hog is greedy, the ass stupid, the fox sly, affords no basis for any but the wildest fancy to see physiognomic similarities between them and human beings who show these bestial traits. If science ever enters this domain, it must be on the broad basis of a vast array of facts that shall enable us to trace phyletic histories and evolutionary pedigrees. In a large sense, heredity itself is an expression, as indeed is nature, but who can say of what? Even the temperaments—choleric, nervous, sanguine, phlegmatic, and perhaps bilious—are not yet very clear to science, basal as they are to characterology, and Warner's[24] typical positions of the hand are still more uncertain. In

[21] From a row of these anthropomantic books, I will note but one of the latest as illustrative of its class, viz, Merton's "Descriptive Mentality." McKay, Philadelphia, no date, pp. 224. This is very copiously illustrated with scores of significances, especially for face and hands.

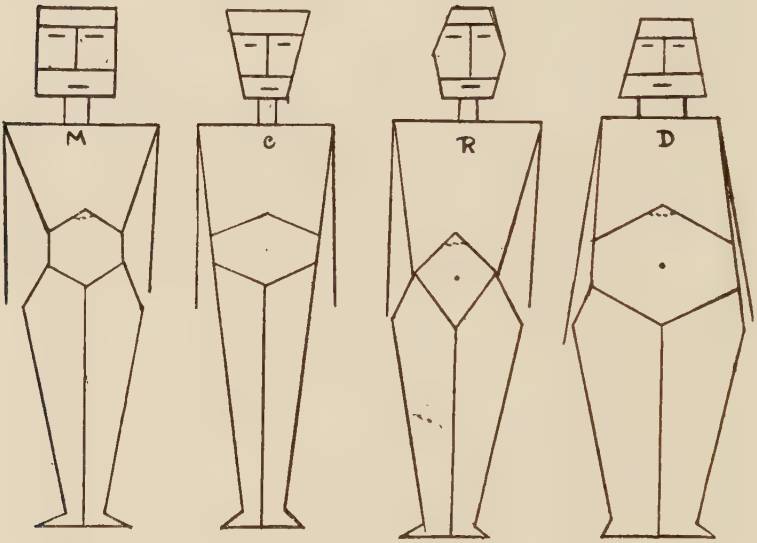
[22] Physiognomische Studien. 1881. pp. 257.

[23] Comparative Physiognomy. New York, 1889. pp. 334.

[24] Physical Expression, its modes and principles. New York, 1886. pp. 372.

fact, in daily life we infer much from lineaments and contour, as well as from gait and carriage, and call the style the man, and there are fashions, modes, and cuts, and truth and lies are told in manners bearing a mien, but even here the ingredient of error often bulks large and the doctrine of character, which when it comes must be chiefly genetic, is yet far off.

A four-fold type of men, first developed by physicians, then taken up by anthropologists, and later found in French military journals during the war, although based on morphology has not only therapeutic but very important psychological classifications, and would seem to be of service in assigning men to different military and civil functions. These pure types, of course, are rare, but it is claimed that in the majority of men one or the other predominates.



(1) The *abdominal* or digestive type (D), if pure, has a large abdomen, jaws, a face slightly pyramidal; is best fitted for certain vocations, needs its own medical treatment, etc. This type is more dependent than any other, both for health and efficiency, upon dietary conditions. Food and drink must be abundant and regular; while there is little power to bear up against hunger, with good food a person of this type can do and bear almost anything. In war it is *par excellence* for

defence. Its greatest power is to repel attack or invasion. Its instincts are protective and conservative. Assaults upon home, possessions, camps, stores, and supplies make such a soldier the one whom the invader has most to fear. In some sense he is childlike. Glandular functions are well developed. The ribs are high, the umbilicus low; the intestinal tract is longer than the average, etc.

(2) The *respiratory* (R) type has a deep chest, body long, especially the thorax; the face is widest across the middle third, including nose and ears, and the head tends to taper slightly above and below. This type needs most air, suffers most if it is defective or deficient; diseases are best cured by change of climate, for their energy is very dependent on the oxygen they breathe. They best endure changes of both temperature and altitude; are susceptible to air too dry or too cold; best bear exposure to wind and weather and love to brave them; their responses to emotional changes are registered in those of respiration. They love exercises that expand the lungs, for their build needs much more aeration than does that of the digestives, though they can get on with far less rations. In war they excel in aviation and mountain work. They are best for attack, loving the dash and rally. They crave excitement, adventure, and pine in mechanism and monotony; tend to buoyancy as the digestives do to depression. Long confinement in the trenches is far harder for them than for the digestives, although the latter excel in patience. Their forte is scouting, spying, pioneering, adventuring, initiative. They can bear solitude but are also prone to conviviality. This type is common among the Nordic races; they have much in common with the old sanguine, are sometimes prognathic, and often have unusual vocal development. This broncho-pulmonary diathesis inclines them more to country than to city life.

(3) The *muscular,* athletic type (M) is characterized by long, strong limbs, a body not very long but well developed, with neither the abdomen nor the thoracic measurements predominating; with a head tending to cubical form; facial diameter more nearly equal in each of the three levels. Their muscles are of greater relative weight than any other class. Such people must have abundant exercise and decline without it to depression and ailments, not only rheumatic, but digestive, circulatory, and nervous. They are at their best when they dig, lift, carry, run, march, throw, and thrive on an amount of work which no other type could sustain with impunity. Their best medicine, if ill, is a more active regimen.

They are less prone to inertness than the digestives; less to excitement than the respiratories. If need be, they can plod on without enthusiasm, with patience and persistence, for they get more pleasure from their own active effort, even if they cannot see its purpose. Long trench confinement is harder on them than for the digestives, but less so than for the respiratories. To do their best, they need a leader more than the respiratories, but less than the digestives, who have less initiative. They endure hunger and bad air, but cannot sustain long inaction, which sours their temper. They live to act and always want to be up and doing. The fatigue point is high but if they go far beyond it, the neuro-muscular system may collapse, although in general they recuperate well. In native intelligence they are between the two preceding classes. Their hair is often more at right angles at its point of insertion in the skin. The neck is long, muscular and large, though not as large as the digestive's. They are often dolichocephalic, and need to be hard up against reality.

(4) The *nervous* or cerebral (C) type has a head broadest at the hat-rim, perhaps tapering downward, so that at the jaw level it may be a little weak and small. The body lacks the marked traits of the other types, is not large but very variable in form and proportion; but the brain dominates other organs and functions more. Here are found the intellectuals whose well or ill being and efficiency depend on their state of mind. Their diseases and cures are more mind-made, so that the conscious and unconscious psyche determine health and activity, and they can do and be what they feel they can. They are most versatile, less dependent on food, air, or exercise than the other three types; more adaptable to any kind of life or branch of service, attack or defence; can wait or fight, adjust to new conditions in the environment quickly; often love the new and strange. Even if they seem frail they can pick up and also develop perhaps to a surprising degree. They respond to everything that affects the emotional tone, the morale, group-spirit. Hence religion, recreation, social intercourse, friendly rapport with officers, comrades, home, helps; so that the *esprit du corps* in camp is what this cerebral or neural type makes it. One of its chief traits is the power to summon reserve possibilities, on emergency, to unfold "the higher powers of man." They can sometimes perform prodigies, but pay dearly for temporary excellence when their reserves are used up. Collapse is more delayed, but if it comes, more prolonged. They prefer the city; intestines are short; they are best in meeting emergencies.

There is quite a literature on this subject, most of which has developed since Sigaud's work on the digestive type, published in 1900. The more morphological traits perhaps are best presented in Chaillou and MacAuliffe's "Morphologie Medicale," (Paris, 1912, 248 p.), while Thooris, Sturel, and many others have applied them to military and also to other vocations.

It seems to me that enough work has been done along this line to justify at least the recognition of the above four types as apperception centers in testing men, particularly where the type is marked, although of course the majority of men are intermediate, or have perhaps two more or less equal groups of traits, and this indifference of type makes for more plasticity and adjustment. But this work shows in a marked way the loss of efficiency in putting men of marked type into environments that fit another type.

All of us psychologists, of course, were much impressed with James's "Higher Powers of Man," and Cannon's application of it, and perhaps with Felta's "adrenaline type." Some of us may have been impressed with the enormous rôle this erethic or second-wind power is playing in psychoanalysis. The same thing, in a different way, is wrought out, from a clinical point of view, in Crile's book, "The Kinetic Drive." In war literature, too, we used often to come across statements to the effect that the war would be won or lost on second breath; and in the literature of the type of Empey's "Over the Top," and also, as I have been told, found in the theories of some who trained for bayonet drill in some of our camps. It is down, too, as one of the traits of the fourth or nervous class of the above French types. In the charge, of course, the man who can summon all his reserves after he seemed and thought himself to be "all in," and perform prodigies in an erethic way, and yet not go wild with abandon, thus meeting extreme emergencies before which others fall down, has an immense advantage, and possibly this is one aspect of Americanitis. Ought we not to be able to, even if we can find no mechanical test of this ability in which men so greatly differ, find out whether, in the individual's experience, he has successfully met great and sudden emergencies, withstood shocks, or whether he has a record of collapsing when they come. I should think that men who have shown such remarkable genius in devising tests as Jung, Yerkes, Thorndike, Dodge, Watson, Scott, Terman, and the rest, could devise some method of testing this power. Personally, I believe—though that is quite aside—it has sex correlates

which might be used with effectiveness for personal ethics and sex hygiene.

After normal fatigue prompts rests, or even sleep, or with the tension of long waiting in the trenches, can soldiers ring up these reserves and feel this afflatus of the war-god; or have their lives been too toned down, monotonous, or over-cultured or self-possessed to enable them to utilize these energies with its high blood-pressure and general overdraft of energy? Is not this the peculiar advantage of young soldiers which is lost with the loss of elasticity in middle life, and which enables those in the early twenties to stand with impunity extra strains of fear or rage, which sometimes makes very commonplace men do prodigies of which they or their friends never dreamed them capable, because they can summate; and is it not connected with the fact that often those who have led sedentary, indoor lives, surpass those whose sturdier frames are used to hard labor? How many of the great achievements of men in every field have been performed in this state? It does seem to be a marked diathesis, and at least officers should be trained to look for manifestations of this power, which, of course, the incidents of war cannot fail to bring out in bold relief. There is much probably in this madness and frenzy with discretion that nothing except the actual incidents of war can show forth, and it seems as though our diagnosis ought not to be oblivious of this point. Among the unprecedented opportunities that the war offered to psychologists (since we do not know very much how the psyche acts when thrown back to its elemental stages into primitive strata), perhaps we ought sometimes to boldly trust our numen where we have as yet no nomen.

Davenport (Nat. Academy Proceedings, June, 1917) thinks that we should consider the fighting-instinct in the appointment of naval officers, and out of 30 great sea-fighters in recent history, he finds that 14 had a clear record as fighters in early life, often in boyhood, besides having other qualities—love of the sea, hyperkinesis, fearlessness, and power to command. We psychologists have long distinguished active and passive temperaments, as Nietzsche did Dionysians and Apollonians; Jung, centrifugal and centripetal; Bryant and Goldthwaite, carnivorous and herbivorous; Haywood's originals versus professionals. It seems to me that our psychology of character shows no greater consensus of the competent than that it distinguishes leaders from led. Men like Sheridan, Stonewall Jackson, Bob Evans, Blücher, we know were "scrappers" from childhood. Of course nothing can test fighting ability

except actual fighting, but almost everyone has some record in regard to pugnacity, and we can know whether he acquitted himself well in juvenile battles and games or ever stood up well against men of his own size and class, or has the diathesis of conflict, whether he loves or fears to take risks.

Weir Mitchell gathered 1,169 records of heroism among all sorts of people, and the Carnegie board of award of medals for heroism has a lot of data, so that it seems that while man was originally the most ferocious of all creatures, (otherwise he would not have survived), this belligerency does differ enormously in different individuals. The Wright brothers had applications from 16,000 young men who wanted to risk their lives in flying. A record of the obstacles of all kinds man has overcome in his past would give a very valuable line as to his efficiency in war or in business.